STATIC AND DYNAMIC PREDICTORS OF INSTITUTIONAL MISCONDUCT AND VIOLENCE AMONG INCARCERATED ADULT OFFENDERS

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ABSTRACT

Increased rates of incarceration coupled with growing rates of institutional violence and major disturbances within U.S. correctional institutions have resulted in increased importance being placed on the development of accurate and efficient correctional risk classification methods. In the current study, institutional infractions were tracked from correctional intake for 17,054 male and female incarcerated offenders. In order to allow for examination of specific categories of problematic behaviors, institutional infractions were categorized according to physically aggressive, verbally aggressive/defiant, and nonviolent infractions. Following analysis of Personality Assessment Inventory (PAI) descriptive statistics that were obtained during correctional intake, the univariate predictive utility of several static and dynamic variables in the prediction of institutional violence and misconduct was examined. Predictor variables included historical, demographic, and self-report (i.e., PAI) information. Among individual variables, subject age, gang affiliation, gender, and PAI Antisocial Features and Aggression scale scores were most predictive of institutional infractions after controlling for the number of days incarcerated. The majority of examined PAI scales remained significant predictors after further controlling for age, gender, ethnicity, and gang affiliation. Despite a low base rate of occurrence, the largest effect sizes were demonstrated in the prediction of physically aggressive infractions. In the final stage of data analysis, multiple regression analyses were undertaken in order to develop an institutional violence risk assessment scheme for potential use in inmate triage/classification procedures and to allow for examination of incremental predictive accuracy of predictor types (e.g., static vs. dynamic). A forward logistic regression resulted in a 9 variable model composed of historical, demographic, and self-report variables that was a robust predictor of adjudication for physically aggressive infractions (AUC = .715, $p < .001$). A violence risk classification scheme was developed that allowed for meaningful distinction between categories of relative risk based on the final model, and differences in accuracy between regression weight-based scores and a simple score method were minimal. Although static and historical/demographic variables were most predictive of future acts of violence, the addition of dynamic and self-report variables resulted in increased predictive accuracy, with each variable type adding unique variance to the prediction of future violent behaviors.

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INTRODUCTION

More than 1.4 million adults are incarcerated in U.S. federal and state correctional institutions (Bureau of Justice Statistics, 2004). According to these authors, rates of incarceration have steadily increased at an average rate of 3.4% per year since 1995, requiring most federal and state institutions to operate at or above capacity. This influx of individuals entering correctional systems has placed increased pressure on prison officials to efficiently classify newly incarcerated offenders (Caperton, Edens, & Johnson, 2004). Balancing efficiency, accuracy, and cost, inmate classification procedures influence most aspects of an individual's incarceration, including housing decisions, special services acquisition (e.g., mental health services), intervention/rehabilitation strategies, institutional privileges, management strategies, and security level (Clements, 1996; Loza & Loza-Fanous, 2002; Proctor, 1994; Van Voorhis & Brown, 1996; Wang & Diamond, 1999). Thus, inmate classification is an important process that has tremendous impact on the nature, quality, and ease of an individual's incarceration (Proctor, 1994).

Historically, correctional classification was an endeavor undertaken by individual correctional officials who relied primarily on expert opinion and clinical judgment to classify newly incarcerated offenders (Proctor, 1994; Van Voorhis & Brown, 1996). In the late 1970s, successful class-action lawsuits (e.g., *Ramos v. Lamm*, 1981) exposed correctional systems' reliance on inconsistent and subjective classification procedures and placed pressure on correctional administrators and lawmakers to develop and implement nondiscriminatory, consistent, and rationally-based inmate classification systems (Clements, 1996; Proctor, 1994; Van Voorhis & Brown, 1996). Psychological measures provide one source of objective information that can be implemented in correctional classification. Although no single measure can comprehensively assess all facets necessary to classify newly incarcerated inmates, psychological measures can provide valuable information regarding specific classification questions (e.g., mental health screening).

Among the most important factors to be considered in the classification of newly incarcerated offenders is potential for violence and other forms of disruptive behaviors (Maghan, 1999). Indeed, maintaining the safety and security of the correctional institutional is most often the highest priority of correctional administrators (Cullen, Latessa, Burton, & Lombardo, 1993). A common belief is that correctional institutions are dangerous places in which the strong prey upon the weak (Hemmens & Marquart, 1999). Although assumptions that correctional institutions are dangerous and chaotic environments likely overestimate the frequency of violent and disruptive behaviors, disruptive and violent behaviors remain a growing problem in correctional institutions (Wang & Diamond, 1999). According to the authors of a U.S. Bureau of Justice report regarding prison violence, the annual rates of reported inmate perpetrated assaults have increased substantially in U.S. federal and state correctional institutions since 1995 (Bureau of Justice Statistics, 2003a). Increases were noted for both assaults perpetrated toward other inmates (32%) and assaults perpetrated toward correctional staff (27%). Similarly, the number of major disturbances, defined as “incidents involving five or more inmates resulting in serious injury or significant property damage" (p. 10) increased by almost 50% during the same time period.

Violent and disruptive inmates create enormous management difficulties for correctional staff and require prison officials to allocate a tremendous amount of resources to maintain the safety and security of a correctional institution (Maghan, 1999). Pressure is placed on correctional officials to efficiently and accurately identify inmates most at risk for violent and disruptive behaviors as early as possible after incarceration in order to implement risk-reduction strategies (e.g., maximum-security housing). Balancing the need to protect the safety and security of an institution, budgetary constraints, and inmate rights, correctional decision makers must be cognizant of repercussions associated with classification errors. Failure to identify violent and/or disruptive inmates can have catastrophic results in regard to staff and inmate safety. However, overly inclusive classification methods result in unnecessary and costly risk-reduction strategies among inmates who are erroneously classified as high risk. Thus, the accuracy of correctional risk assessment schemes is of paramount importance to safety, civil liberties, and cost. This distinction is particularly pronounced in death penalty hearings, as several states included offender risk for prison violence as an aggravating and/or mitigating factor (Cunningham & Reidy, 1998b).

Considerable progress has been made in correctional classification since legal decisions held correctional systems liable for inconsistent classification procedures (Clements, 1996). Although traditional classification procedures have demonstrated utility for a variety of purposes, they have fared less well in the prediction of violent and disruptive institutional behaviors, due in part to methodological limitations inherent in the prediction of future behaviors (e.g., low base rates; Van Voorhis & Brown, 1996). A multitude of research has greatly advanced the field of risk assessment (Monahan, 1996). In particular, the development and implementation of methodologically sound actuarial methods has greatly improved the accuracy of forecasts of future violence and antisocial behavior (Loza & Dhaliwal, 2005). Although researchers have overwhelmingly focused on methods of forecasting violence in the community (Wang & Diamond, 1999), a burgeoning literature reflects renewed interest in applying these methodological advancements to the classification of inmate risk for violent and disruptive institutional behaviors. Likewise, as will be discussed in detail in a later section, researchers have increasingly investigated the utility of empirically supported community risk appraisal measures in the prediction of problematic institutional behaviors.

In response to growing need within the criminal justice system, several measures that incorporate methodologically sophisticated prediction schemes have been developed specifically for the prediction of violent recidivism in the community (Kroner & Mills, 2001; Monahan, 2001). Such models of violence prediction have gained popularity in response to poor predictive validity of purely clinical methods and have consistently demonstrated increased predictive accuracy over traditional methods (Quinsey, Harris, Rice, & Cormier, 1998, 2006). However, the practicality and appropriateness of many such measures in correctional risk assessment remains questionable and has been relatively unexamined by risk assessment and correctional researchers.

When considering the practical utility of risk appraisal measures, in addition to providing predictive accuracy and information relevant to institutional management, the cost and ease of a given measure must be considered (Buffington-Vollum, Edens, Johnson, & Johnson, 2002; Kroner & Mills, 2001; Van Voorhis & Brown, 1996). Although initial research has indicated community risk assessment prediction schemes may be of use in correctional settings (Kroner & Mills, 2001), the nature and cost often associated with actuarial risk appraisal methods have precluded widespread use in general risk classification. That is, because these measures often require intensive record reviews, information from collateral sources, clinical interviews, and highly trained administrators, their use for general offender risk classification procedures would be a very costly and impractical practice.

A related problem regarding the use of risk assessment methods validated in the community to forecast violent and disruptive behavior in correctional settings is that they are based solely upon correlates of violence in the community. Although some degree of overlap between contexts is expected, the influence of environment likely affects the strength and direction of relationships between risk factors and problematic behaviors. A prime example is the impact of major mental illness on future behaviors. As will be discussed in a later section, the evidence has been mixed regarding major mental illness as a risk factor for violence in the community (Monahan et al., 2001; Teplin, Abram, & McClelland, 1994); however, investigations with incarcerated populations have consistently demonstrated major mental illness to be associated with greater likelihood of exhibiting problematic institutional behaviors (Baskin, Sommers, & Steadman, 1991; Toch & Adams, 1986, 2002; Toch, Adams, & Greene, 1987; Warren, Hurt, et al., 2002) Similarly, potential risk factors that may be unique to correctional settings are not included in risk estimates derived from community-based measures. Little research to date has specifically addressed differences in risk factors across correctional and community contexts, leaving many questions unanswered regarding the generalizability of community research to incarcerated offenders.

Researchers have recently attempted to integrate empirical correlates of violent prison behaviors into violence prediction schemes specifically for use with incarcerated populations (Cunningham, Sorensen, & Reidy, 2005; Sorensen & Pilgrim, 2000). In addition to seeking to increase the accuracy and reliability of risk assessments in correctional environments, these authors have sought to create practical prediction schemes by including variables that are readily available to prison officials (e.g., age, criminal history, and sentence length). The need for efficient and economic risk classification procedures has also created renewed interest in self-report methods. Despite having been traditionally viewed with skepticism in correctional and forensic environments, the ease of administration and interpretation and the relatively low cost associated with self-report methodologies has prompted administrators and researchers to consider such measures for prediction of problematic institutional behaviors (Buffington-Vollum et al., 2002).

Because few researchers have examined self-report methods for the assessment of general population offenders, their utility in the classification of recently incarcerated offenders is largely unknown. Likewise, a dearth of research regarding the assessment of female offenders has further limited the applicability of many prediction schemes and risk factors. Although many recently developed prediction schemes show promise as general correctional risk classification methods, methodological limitations (such as small sample sizes, impoverished criterion variables, and retrospective research designs) have further limited widespread applicability of most schemes. Such methodological problems have also plagued much of the research regarding correlates to problematic institutional behaviors, thus raising questions regarding the generalizability of findings across correctional environments and populations.

Overall, despite the many insights that have been gained regarding risk factors of disruptive and violent institutional behaviors among incarcerated offenders as a result of several decades of empirical investigation, much work remains to be done to inform correctional policy and risk reduction methods. The importance of continued investigation cannot be understated, as research informs sound correctional philosophy, which is among the best defenses of the rising rate of prison violence (Walters 1998). Indeed, “as other correctional innovations come and go, risk assessment continues to change the face of correctional practice” (Van Voorhis & Brown, 1996, p. 1).

Broadly stated, the purpose of the current study was to add to a growing literature base regarding correctional risk assessment and classification with the intent of informing sound and ethical correctional policy and practice. Heavy emphasis was placed on instituting procedures that improved upon many methodological problems associated with a majority of the correctional risk assessment literature. The first primary aim of this study was to investigate the utility of several potential risk factors for problematic institutional behaviors among a large and diverse sample of male and female incarcerated offenders. In addition to the examination of many historical and demographic variables (e.g., age), the utility of the Personality Assessment Inventory (PAI; Morey, 1991) in correctional risk classification was a major focus of this study. A second primary aim of this research was to develop and validate a correctional violence risk scale composed of the most robust individual predictors of correctional violence. This scale was created to allow for specific examination of the incremental accuracy of various types of variables, including risk, protective, static, dynamic, self-report, and demographic/historical variables in correctional risk assessment, which has been the focus of relatively little previous research. Finally, this research sought to utilize the PAI to examine the general personality functioning and psychopathology level of adult offenders undergoing correctional classification in comparison to community norms.

LITERATURE REVIEW

The development of sound risk classification methods is dependent upon knowledge of pertinent risk and protective factors of violent and disruptive behaviors among incarcerated offenders. The following review begins with the identification and discussion of several empirically identified correlates to problematic institutional behaviors among incarcerated offenders. Following a critique regarding the practicality and usefulness of several risk factors in correctional risk classification, the utility of many popular psychological measures and risk assessment methods in correctional environments is discussed. Specific emphasis is placed on the PAI, which is a primary component of the current study. The review concludes with a discussion of several methodological problems associated with risk assessment and the prediction of violent and antisocial behaviors.

Risk Factors for Institutional Aggression and Misconduct

Violent and antisocial behaviors are complex, multifaceted phenomena that are influenced by several categories of antecedents (Monahan & Steadman, 1994). Although now considered a common task in forensic and correctional settings, early research into clinical judgment suggested that clinicians could not reliably forecast violent/criminal behaviors (Loza, 2003). Endorsing such conclusions, the members of the American Psychological Association's Task Force on the Role of Psychology in the Criminal Justice System (1978) stated that:

> It does appear from reading the research that the validity of psychological predictions of violent behavior, at least in the sentencing and release decisions we

> are considering, is extremely poor, so poor that one could oppose their use on the strictly empirical grounds that psychologists are not professionally competent to make such judgments. (p. 1110)

However, over the three decades subsequent to this statement, a great deal of research into empirical and theoretical determinates of violent/antisocial behavior has resulted in tremendous insights into risk factors for problematic behaviors among forensic/clinical populations (Bonta, 1996; Loza, 2003; Loza & Dhaliwal, 2005). The inclusion of such factors into clinical decision making has served to increase clinicians' predictive accuracy (Loza, 2003).

Spanning multiple domains, empirically supported risk factors to violent/antisocial behaviors include historical, clinical, situational, and dispositional variables (Monahan & Steadman, 1994). The determinants of violent/antisocial behaviors are most often categorized by researchers as static or dynamic. Static variables are predictors that have been associated with long-term risk that are not generally amenable to change (Bonta, 1999; Gendreau, Little, & Goggin, 1996; Loza, 2003). Examples of static variables include ethnicity, gender, criminal history, index offense, childhood behavioral problems, and age. Often referred to as criminogenic needs, dynamic variables include predictors that are malleable (Bonta, 1999; Gendreau et al., 1996; Loza & Dhaliwal, 2005). Dynamic predictors of violent/antisocial behaviors include environmental factors, psychopathology, substance abuse, antisocial attitudes/beliefs, and poor coping skills. Because dynamic factors are susceptible to change, they represent robust targets for risk management strategies and are often used when evaluating change (Bonta, 1999; Loza, 2003; Loza & Dhaliwal, 2005; Wang & Diamond, 1999).

After reviewing the applicable research, Loza (2003) argued that static variables are generally more predictive of antisocial/violent behaviors than dynamic variables; however, others have contended that dynamic variables yield a level of predictive accuracy that is similar to that of static variables (Bonta, 1999). Nonetheless, the general consensus is that both static and dynamic variables add uniquely to the prediction of violent/antisocial behaviors and should be considered in tandem when attempting to forecast offender behavior (Bonta, 1999; Loza, 2003; Loza & Dhaliwal, 2005; Monahan & Steadman, 1994). In this section, I review pertinent research into various static and dynamic risk factors for institutional aggression and other problematic institutional behaviors. Conclusions are drawn regarding the utility of each construct in the prediction of institutional violence and misconduct among incarcerated offenders.

Anger/Impulsivity

Anger is a functional, adaptive emotional state (Novaco, 1994). Although recognized to be related to aggressive and antisocial behaviors (Cornell, Peterson, & Richards, 1999; Novaco, 1994; Suter, Byrne, Byrne, Howells, & Day, 2002), even intense anger does not always result in aggressive behaviors, and antisocial/violent acts can occur in the absence of anger (Novaco, 1994; Monahan et al., 2001). Novaco (1994) described anger as having a mediating effect, stating that the "degree to which anger constitutes a risk factor for violence hinges on its operation as a mediator of the relationship between aversive events (occurrences the person would choose to avoid) and harm-doing behavior" (p. 53). Nonetheless, higher anger levels have been associated with violent and antisocial behaviors among a variety of populations, including released psychiatric patients (Appelbaum, Robbins, & Monahan., 2000; Monahan et al., 2001), spousal abusers (Norlander & Eckhardt, 2005), adjudicated juvenile offenders, (Cornell et al., 1999; Granic & Butler, 1998), and female offenders (Walters & Elliot, 1999).

Wang and Diamond (1999) employed structural equation modeling to analyze the influence of several factors, including anger, on institutional aggression among mentally ill incarcerated offenders. Utilizing elevations on the PAI Aggressive Attitude subscale (AGG-A) and the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) Anger and Hostility subscales as indicators of anger, these authors tracked the institutional behaviors of 385 male offenders who had received psychiatric treatment in a prison hospital for 2 months following test administration. Consistent with community research, higher anger levels were found to be strongly associated with both subsequent verbally aggressive and physically aggressive institutional infractions among participants. Among all predictor variables, which included index offense, ethnicity, antisocial personality traits, and ethnicity, anger was the best predictor of institutional aggression.

In an examination of the influence of anger on the prediction of aggression among incarcerated adolescent males, Cornell et al. (1999) found anger to be moderately predictive of institutional aggression at 3 months following admission to a youth correctional center. Although no anger scales were associated with the number of prior violent offenses, trait anger (i.e., an enduring propensity to become angry), as measured by the State-Trait Anger Expression Inventory (STAXI; Spielberger, 1988), was most predictive of both physically and verbally aggressive institutional violations. Similarly, one's propensity to express anger outwardly was significantly associated with subsequent physical and verbal aggression. Participants' ability to prevent or to recover from anger was negatively associated with physically aggressive misconduct, such that those participants with greater anger management skills were less likely to become physically aggressive during incarceration.

Although the majority of evidence has been generally supportive of the construct of anger as a correlate of institutional misconduct and violence, a more recent prospective investigation showed little to no relationship between anger and criminal history, institutional misconduct, or criminal recidivism among incarcerated violent offenders (Mills & Kroner, 2003). The only significant relationship was a weak association between the STAXI Anger Out scale and the Cognitive scale of the Novaco Anger Scale and minor institutional misconducts, both of which failed to remain significant after controlling for the variance associated with impression management effort. In a discussion of their findings, these authors noted that because anger is an acute dynamic risk factor (i.e., dynamic state), a measure of anger at the time of correctional intake is unlikely to reliably predict long-term behaviors. Likewise, they hypothesized that other variables, such as poor coping skills, may serve to moderate any relationships between anger and violent behaviors.

A somewhat related construct, in that it may play a moderating role in relationship between anger and aggressive/antisocial behaviors, impulsivity (also termed "impulsiveness" by some authors) has been defined as being associated with the control of one's thoughts and behaviors (Barratt, 1994). Indeed, impulsivity is considered by many to be highly connected to delinquent and criminal behaviors (Ellis & Walsh, 1999), and has been associated with aggressive behaviors among psychiatric patients (Appelbaum et al., 1999) and juvenile offenders (Lynman et al., 2000). Likewise, some authors have postulated that the large effect of age on aggressive institutional behaviors among incarcerated individuals may be partially explained by impulsivity, which has been associated with younger ages (Toch et al., 1987).

A handful of recent studies have examined the role of impulsivity in problematic institutional behaviors among incarcerated offenders. In their investigation into risk factors to institutional violence among mentally ill incarcerated offenders, Wang and Diamond (1999) found impulsivity, as measured by the Barratt Impulsivity Scale (BIS-11; Barratt, 1994), to be highly related to anger and antisocial personality style. Although greater impulsivity was associated with subsequent verbal aggression, the authors did not find a direct relationship between impulsivity and physical aggression. However, in an examination of the utility of the HCR-20 (Webster, Eaves, Douglas, & Wintrup, 1995) in the prediction of institutional violence among incarcerated adult male offenders, Belfrage, Fransson, and Strand (2000) found higher impulsivity levels among inmates who committed subsequent violent infractions than among inmates who had not been convicted of a violent infraction. Likewise, investigators have demonstrated that higher scores on the Cutoff Scale of the Psychological Inventory of Criminal Thinking Styles (PICTS; Walters, 1995), which is reflective of impulsivity, anger, and irresponsibility, were associated with problematic institutional behaviors, including physical and verbal aggression, among male (Walters, 2006a) and female offenders (Walters & Elliot, 1999).

Taken together, although the relative contribution of anger and impulsivity to predictive schemes appears to be dependent on how one assesses these constructs and on the population of study (e.g., mentally ill inmates), the results of the reviewed studies suggest that elevated anger and impulsivity levels are pertinent risk factors to problematic institutional adjustment. Moreover, the demonstrated relationship between such dynamic factors and problematic institutional behaviors is good news in terms of offender treatment and violence prevention, such that anger and impulsivity offer robust targets for clinical intervention (Wang & Diamond, 1999). Nonetheless, future research and cross validation studies are necessary to determine the most appropriate method of assessing anger and/or impulsivity with incarcerated populations and to determine the long-term predictive utility of such constructs.

Psychopathy

Psychopathy has been described as the single most important clinical construct for the criminal justice system (Hare, 1998; Hemphill & Hare, 2004). Although the past 25 years have resulted in a boom in psychopathy research, particularly regarding its relationship with violent recidivism, evidence of psychopathy as a formal clinical construct can be traced back more than a century (Hare, 1996). Nonetheless, researchers continue to debate the nature and meaningfulness of the construct of psychopathy, including the development and utility of purported measures of psychopathy (Blackburn, 1988; Hare, 1996; Walters, 2003).

Walters (2003) described two general approaches that have been implemented by researchers in the examination of psychopathy: the behavioral approach and the personality model. Proponents of the behavioral approach emphasize observable antisocial acts that often date back to childhood and adolescence. Such conceptualizations are best illustrated by the diagnostic criteria of antisocial personality disorder in the third and fourth editions of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; American Psychiatric Association, 1980, 1987, 1994, 2000); current criteria place heavy emphasis on behavioral characteristics such as antisocial acts and violation of social norms. The reluctance of the authors of the *DSM* to include personality traits that many consider to be more reflective of psychopathy has resulted in strong criticism from some psychopathy researchers (Hare, 1996).

In sharp contrast to behavioral models of psychopathy that give little credence to personality factors, the personality model described by Walters (2003) emphasizes affective and interpersonal characteristics (Guy, Edens, Anthony, & Douglas, 2005; Hare, 1996). This model was first proposed in the seminal work of Cleckley (1941) and continues to influence modern conceptualizations of psychopathy (Guy et al., 2005). Cleckley defined psychopathy as a core personality disorder that is manifested by a *Mask of Sanity* that serves to disguise underlying irrational processes. Although he acknowledged that antisocial behaviors are often exhibited by such individuals, Cleckley viewed such behaviors as a consequence of a pathological personality, rather than as a symptom. Personality features that he characterized as being indicative of psychopathy included superficial charm, lack of remorse, pathological egocentricity, poor insight, and poverty of major affective reactions. Cleckley's influence continues today, as many of the features he first described in detail are present in modern conceptualizations of psychopathy (Hare, 1996).

Widespread disagreement regarding the most appropriate operational criteria for psychopathy has led some authors to question whether existing research has allowed for comparison between studies (Harpur, Hare, & Hakstian, 1989). In order to provide an explicit and reliable procedure for the assessment of psychopathy that would assist researchers in this area, Hare (1980) developed the Psychopathy Checklist (PCL). In addition to assessing personality traits consistent with Cleckley's (1941) personality model of psychopathy, the PCL, as well as its revision and an updated version (PCL-R and PCL-R-2nd edition; Hare, 1991, 2003), include items related to antisocial and criminal behaviors (Harpur et al., 1989; Walters, 2003). Reflective of such dimensions, Hare (1996) described psychopathy as a multidimensional construct:

> Psychopathy is a socially devastating disorder defined by a constellation of affective, interpersonal, and behavioral characteristics, including egocentricity; impulsivity; irresponsibility; shallow emotions; lack of empathy, guilt or remorse; pathological lying; manipulativeness; and the persistent violation of social norms and expectations. (p. 25)

Although some disagreement continues to exist regarding the definition of psychopathy, extensive research with the PCL and PCL-R has resulted in Hare's measures essentially becoming the gold standard for assessment of the concept (Guy et al., 2005; Kosson, Steuerwald, Forth, & Kirkhart, 1997). Consequently, the conceptualization of psychopathy underlying the measures has become the foundational definition upon which the majority of current psychopathy research is based (Guy et al., 2005).

Strong psychometric properties of the PCL and PCL-R suggest that they measure a unitary construct (i.e., psychopathy) and a total score is derived when the PCL is scored; however, initial factor analyses also demonstrated a stable factor structure made up of two distinct factors that are also scored individually (Hare et al., 1990; Harpur et al., 1989). Factor 1 is composed of items that assess affective and interpersonal traits (i.e., personality), which is considered by many to be at the core of psychopathy (Hare, 1996). Factor 2 represents features associated with an antisocial/socially-deviant lifestyle (i.e., behavioral characteristics; Guy et al., 2005; Hare, 1996; Walters, 2003). More recently, researchers have proposed and examined three-factor (Cooke & Michie, 2001; Vitacco, Rogers, Neumann, Harrison, & Vincent, 2005) and four-factor models of psychopathy

(Hare, 2003; Hill, Neumann, & Rogers, 2004; Neumann, Vitacco, Hare, & Wupperman, 2005; Vitacco, Neumann, & Jackson, 2005); however, as no researcher to date has examined either model in correctional settings, a review of that literature is beyond the scope of this paper.

The PCL/PCL-R has been shown to be a robust predictor of general and violent criminal recidivism among released offenders (Hart, Kropp, & Hare, 1988; Hemphil, Hare, & Wong, 1998; Salekin, Rogers, & Sewell, 1996; Serin & Amos, 1995). Using the PCL-R, the Psychopathy Checklist Screening Version (PCL:SV; Hart, Cox, & Hare, 1995), and the Psychopathic Personality Inventory[1] (PPI; Lilienfeld & Andrews, 1996), researchers have demonstrated significant relationships between psychopathy and early institutional adjustment (Heilbrun et al., 1998), institutional aggression (Hill, Rogers, & Bickford, 1996), past violence (Kruh et al., 2005), and post-discharge (Monahan et al., 2001) violent recidivism among forensic patients. Given the established link between psychopathy and criminal recidivism and violence in the community, as well its relationship with institutional adjustment within forensic settings, many have examined the generalizability of such findings to correctional settings. Although early examination of psychopathy as a predictor of violence in correctional settings resulted in promising results (Hare & McPherson, 1984), the results of several subsequent studies have cast doubt on the utility of a unitary construct of psychopathy in the prediction of institutional adjustment and violence.

One of the earliest and most frequently cited examinations of psychopathy and institutional behaviors in correctional settings was undertaken by Forth, Hart, and Hare

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[1] The PPI is a self-report measure designed to assess personality traits associated with psychopathy and will be discussed in greater detail in a later section.

(1990). Utilizing a modified version of the PCL with incarcerated Canadian male youth offenders, Forth and colleagues found a strong relationship between the PCL total score and the number of violent or aggressive institutional charges recorded in institutional records ($r = .46$); however, methodological problems have led others to question the usefulness of these findings. More specifically, because violence and aggression were postdicted (i.e., the relationship examined was between the PCL and prior institutional charges), concerns of criterion contamination have been raised because the criterion of interest (i.e., previous violent and aggressive institutional behaviors) was not independent of several PCL items related to previous violent behaviors (Cunningham & Reidy, 1998a; Edens, Petrilla, & Buffington-Vollum, 2001).

In a validation study of the Interpersonal Measure of Psychopathy (IM-P), Kossen et al. (1997) retrospectively examined the relationship between PCL-R factor scores, IM-P scores, and institutional misconduct among adult male offenders incarcerated in a U.S. federal correctional institution. According to the authors, the IM-P was designed to be an adjunct to the PCL-R in which the interpersonal aspects of psychopathy are assessed through a direct examination of the interactions between interviewer and participants. Although the authors found significant correlations between both PCL-R factor scores and a history of violent charges and adult fights, neither PCL factor scores or the IM-P total score was significantly correlated with violent or nonviolent institutional infractions.

Because of concerns regarding the efficiency of the PCL-R as an intake screening instrument, as well as to address the failure of previous research on psychopathy and violent criminal recidivism to consistently generalize to institutional violence in correctional settings, Edens, Poythress, and Lilienfeld (1999) compared two measures of psychopathy, the PCL-R and the PPI, in relation to institutional misconduct. Employing a retrospective examination of the relationship between PPI and PCL-R scores among 50 ethnically diverse youth offenders incarcerated in Florida, Edens et al. improved upon the methodological limitations of prior studies by classifying institutional infractions as nonaggressive, physically aggressive, and verbally aggressive infractions. Both the PPI and PCL-R total scores, as well as both PCL-R factor scores, displayed modest correlations with a combined category of verbally and physically aggressive infractions, with neither measure displaying incremental validity when compared to the other. However, when broken down according to type of infraction, only Factor 2 scores were significantly correlated with physically aggressive infractions. Likewise, the PPI total score was the only score significantly associated with verbally aggressive infractions, and no scores were significantly related to nonaggressive infraction. Although all correlations were in the expected directions, the authors acknowledged the low power of the study as a significant limitation.

Edens, Poythress, and Watkins (2001) utilized a similar research design when comparing the PAI Antisocial Features scale (ANT) and the PPI with a sample of adult male offenders incarcerated in Florida. Following the institutional infraction categories defined by Edens et al. (1999), Edens, Poythress, et al. (2001) found the PPI total score to be significantly correlated with three infraction categories: physically aggressive, nonaggressive, and any institutional infractions. No significant relationship was found between verbally aggressive infractions and the PPI. Significant correlations were found between all categories of infractions and the PAI ANT scale. After partialing out the variance accounted for by each measure, only the relationship between ANT and the any-infraction category remained significant. That is, neither measure accounted for much variance in institutional infractions beyond the other. Although the authors acknowledged that many of the significant point biserial correlations between both measures and all categories of infractions were somewhat low in magnitude (i.e., PPI correlations ranged from .26 to .37), they countered that the strength of each relationship was constrained by low base rates for physically and verbally abusive infractions. Thus, when base rate was considered, the obtained correlations were more substantial than they initially appeared. As with the previously cited study, small sample size and a postdictive research design were significant limitations to this research.

In a predictive study utilizing the methodology outlined by Edens et al. (1999) and Edens, Poythress, et al. (2001), Buffington-Vollum, Edens, Johnson, and Johnson (2002) examined the utility of the PCL-R and the PAI ANT scale in the prediction of institutional misconduct among 58 adult male sex offenders incarcerated in Texas. At 2 years post administration, both the PCL-R total score and ANT score showed moderate correlations with verbally aggressive infractions, nonaggressive infractions, and any institutional infraction; however, neither measure was significantly related to physically aggressive infractions. As described earlier, the authors noted the magnitude of each correlation to be dependent on a low base rate of infractions. Incremental validity of the PCL-R total score was found with verbally aggressive infractions, whereas ANT was shown to have incremental validity for nonaggressive infractions. Similar to Edens et al.'s (1999) and Edens, Poythress, et al.'s (2001) findings, low power, due to a small sample size, appears to have limited the generalizability of these findings.

Although the ability of measures of psychopathy to successfully forecast correctional institutional violence and infractions has been quite heterogeneous across studies in the United States (Guy et al., 2005), stronger effect sizes and greater consistency among studies have been noted with Canadian and European populations. In a large study of 652 male offenders incarcerated in several English correctional institutions, Hare, Clark, Grann, and Thornton (2000) found significant moderate correlations between PCL-R total score and institutional infractions for assaults on staff, assaults on inmates, and property damage. Significant differences in PCL-R scores were also found between offenders who had committed at least one infraction and those with no infractions. Likewise, 75% of inmates with PCL-R total scores of 30 or higher were found to have committed at least one infraction, whereas only 44% of those with a PCL-R total score below 30 had committed an infraction (a PCL-R total score of $\geq$ 30 is the traditional cut score for diagnosing psychopathy; Hare, 2003). Although further analyses revealed that the number of prior convictions and age were better predictors of total number of infractions than was the PCL-R total score, PCL-R scores were found to be the most predictive of assaults, even when factors such as sentence length, age, offense type, and the number of previous convictions were taken into account.

Kroner and Mills (2001) compared the accuracy of five risk appraisal instruments in the prediction of institutional misconduct of 97 male violent offenders incarcerated in a Canadian federal institution. Finding no statistical differences between instruments, the PCL-R was reported to be a moderate predictor of major institutional infractions and a strong predictor of minor infractions (Rice & Harris, 2005). Similarly, in an examination of the relationship between the HCR-20 (Webster, Douglas, Eaves, & Hart, 1997) and institutional adjustment within two Swedish maximum security correctional institutions, Belfrage, Fransson, and Strand (2000) found statistically significant differences in the median PCL:SV scores between offenders who committed infractions and those who did not. Among the 41 offenders examined, both PCL:SV Factor 2 and total scores were significantly higher for offenders who committed at least one infraction than for offenders who did not commit and infraction. When examining those identified as psychopaths (*n* = 30), only the PCL:SV Factor 2 median score difference continued to show significant differences between those who committed at least one infraction and those who did not.

As the psychopathy research base has continued to grow, researchers have recently employed meta-analysis techniques to investigate the relationship between psychopathy and institutional adjustment. In a meta-analysis examining the validity of the PCL/PCL-R factor structure in the prediction of institutional infractions and recidivism among forensic and correctional populations, Walters (2003) found Factor 2 scores to be moderately associated with both violent and nonviolent institutional infractions. Although Factor 1 scores were significantly correlated with institutional infractions, Factor 2 scores correlated with institutional infractions at a significantly higher magnitude. However, the difference in predictive accuracy between the two factors was much less pronounced for institutional infractions than for criminal recidivism. Nonetheless, demonstrating Factor 1 to be inferior to Factor 2 in the prediction of both violent and nonviolent outcomes, these results lend support to behavioral models of psychopathy. Attempting to explain the significant heterogeneity across effect sizes, Walters examined the effects of age, gender, and type of outcome criterion (e.g., institutional infractions, recidivism); however, none of these variables were found to significantly moderate effect sizes.

To address the methodological limitations of Walters' (2003) design, including the heterogeneity across samples and an overly broad range of behaviors that were labeled as violent, Guy et al. (2005) undertook a more focused meta-analytic investigation of the association between Hare's psychopathy measures (i.e., PCL, PCL-R, and PCL:SV) and institutional misbehaviors within civil psychiatric, forensic psychiatric, and correctional institutions. Similar to results of previous investigations, the authors found an overall robust effect size for the relationship between psychopathy and institutional misconduct, with Factor 2 scores displaying significantly higher associations than Factor 1. Correlations between PCL-R indices and physically violent infractions were significantly lower than correlations between PCL-R indices and other types of misconduct. However, consistent with Walters's (2003) finding, a high degree of variability of effect sizes across studies precluded broad generalization about the magnitude of effects. Thus, Guy et al. asserted that the context in which an assessment is made is essential to understanding the relationship between psychopathy and institutional adjustment. The most pronounced differences occurred between U.S. and non-U.S. samples across settings, with the largest differences occurring in correctional samples. More specifically, U.S. samples displayed significantly smaller effect sizes for all categories of aggressive and violent misconduct than did European and Canadian samples. Additionally, gender did not significantly moderate any of the examined relationships, lending support to previous findings that the relationship between psychopathy and institutional misconduct does not differ for men and women.

Overall, the results of research examining psychopathy and correctional institution have been mixed. Although recent meta-analyses have provided a basis for comparison, the highly divergent results across studies and environments, as well as methodological limitations continue to cloud firm conclusions regarding the utility of psychopathy in the prediction of correctional institution misconduct and violence. Nonetheless, it appears that the antisocial behavior aspect of psychopathy (i.e., Factor 2) has been significantly more predictive of negative institutional behaviors than have the purely personality aspects (i.e., Factor 1) or a combination of both (i.e., total score). Thus, these findings are consistent with research that has suggested that, in general, past behavior is among the best predictors of future behaviors (Ouellette & Wood, 1998).

The wide range of effects sizes across studies raises questions as to the generalizability of findings across contexts. In particular, significantly reduced effect sizes among U.S. samples when compared with European and Canadian samples highlight the importance of context in the relationship between psychopathy and correctional institution infractions. Likewise, the strength of the PCL-R in the prediction of general and violent recidivism in the community, as well as institutional infractions in forensic facilities, has not been consistently replicated in correctional institutions. As such, several researchers have expressed concern that the general community-psychopathy research base will be inappropriately applied to individuals entering U.S. correctional institutions, resulting in more severe dispositions (Edens, Petrilla, et al., 2001; Loza, 2003). Certainly more research addressing the relationship between psychopathy and institutional adjustment within U.S. correctional institutions is needed to inform administrators, clinicians, and criminal justice professionals, as the number of studies pale in comparison to the research base examining psychopathy in forensic institutions and within the community. Likewise, meta-analyses that specifically examine psychopathy in correctional institutions would be helpful in this regard.

Despite the variability across studies, methodological problems, and the existence of relatively few studies in correctional environments, research into the long-term behaviors of incarcerated offenders scoring high on psychopathy have raised further questions as to the utility of the psychopathic construct in predicting institutional misconduct. That is, given the low base rate of violent infractions among incarcerated offenders (as well as the difficulty in applying predictions based on group data to a specific individual), it is virtually impossible to make accurate predictions as to which offenders scoring high on psychopathy will commit a violent infraction (Edens 2001; Edens, Petrilla, et al., 2001). As with general population offenders, researchers have demonstrated that a majority of offenders scoring high on psychopathy do not commit violent infractions while incarcerated (Buffington-Vollum et al., 2002; Edens, Petrilla, et al., 2001), thus reinforcing the importance of environmental/contextual factors in the inhibition of aggression (Buffington-Vollum et al., 2002). In fact, researchers have presented evidence that the behavior of offenders who score high on psychopathy and who have previously committed violent institutional infractions can be modified through the manipulation of environmental factors (Hare et al., 2000; Heilbrun et al., 1998).

Thus, when considering the evidence regarding the behavior of individuals identified as psychopaths in correctional settings, coupled with the reviewed research on the relationship between psychopathy and correctional institutional misconduct, overreliance on the construct of psychopathy in the identification and classification of offenders who are most likely to act out while incarcerated in U.S. institutions appears to be a problematic strategy that is likely to result in erroneous conclusions.

Antisocial Personality Disorder

Although references to individuals who display a longstanding pattern of antisocial behavior can be found in early diagnostic nomenclature, antisocial personality disorder (APD) was not explicitly defined until the *DSM-III* (American Psychiatric Association, 1980) was published (Hare, 1996). Composed of criteria regarding previous criminal and antisocial behaviors, APD is currently defined as “a persistent pattern of disregard for, and violation of, the rights of others that begins in childhood or early adolescence and continues into adulthood” (American Psychiatric Association, 2000, p. 701).

Classified by the American Psychiatric Association (2000) as a construct similar to psychopathy, Hare (1996) has argued that, although APD and psychopathy share some similar features, a diagnosis of APD is insufficient in the identification of psychopathic offenders. As previously discussed, the construct of APD has generally been described as flawed when compared to psychopathy because no diagnostic consideration is given to affective or interpersonal characteristics (Hare, 1996; Hart & Hare, 1997; Widiger & Corbitt, 1995). Nonetheless, some clinicians and researchers have continued to inappropriately equate APD and psychopathy, which has resulted in further construct confusion and misleading conclusions (Hare, 1996, 2003). Thus, although many features of APD and psychopathy are related, in order to avoid perpetuating confusion, for the purpose of this review discussion regarding the relationship between APD and institutional violence is undertaken separately from the discussion of psychopathy.

Given that many PCL/PCL-R Factor 2 items closely resemble APD criteria, it is not surprising that strong correlations have been found between Factor 2 scores and a diagnosis of APD (Harpur et al., 1989). However, it has been argued that an overreliance on antisocial and criminal behaviors has resulted in overuse of the APD construct in forensic and correctional settings and underdiagnosis of APD in noncriminal justice settings (Widiger & Corbitt, 1995). Researchers have suggested that about half of all incarcerated offenders meet criteria for APD (Stevens, 1994), with estimates of prevalence rates ranging from 50% to 75% for male offenders (Fazel & Danesh, 2002; Hare 1983, 1985, 1996) and 25% to 43% for female offenders (Fazel & Danesh, 2002; Warren, Burnette, et al., 2002). Because of the high base rate in correctional settings, a diagnosis of APD appears to offer little help in distinguishing offenders who are likely to act out while incarcerated (Clements, 1996; Cunningham & Reidy, 1998a, 1998b), particularly considering the low base rate of violent offenses that was previously noted. Similarly, researchers have demonstrated that more than half of individuals in the community who meet criteria for APD have no significant arrest record (Robins, Tipp, & Przybeck, 1991).

A second point of concern that has resulted from overreliance on behavioral criteria when diagnosing APD is the overlap between APD and substance abuse disorders (Cunningham & Reidy, 1998a; Gerstly, Alterman, McLellan, & Woody, 1990; Widiger & Corbitt, 1995). Because the act of abusing substances is considered an antisocial behavior, as well as the fact that substance abuse often results in further antisocial behavior (Gerstly et al., 1990), it is difficult to determine whether APD is driving the substance use disorder or vice versa (Cunningham & Reidy, 1998a) or whether both are manifestations of yet a third factor. This problem is further exacerbated by higher rates of substance use disorders among incarcerated populations; researchers have demonstrated that between 20% to 50% of incarcerated offenders are dependent on at least one substance at the time of incarceration (Fazel, Bains, & Doll, 2006; Lo & Stevens, 2000).

Although there is some evidence to suggest that a diagnosis of APD is associated with violent recidivism among released forensic patients (Monahan et al., 2001), few researchers have specifically examined the relationship between APD and institutional behavior among incarcerated offenders. In addition to the weaknesses inherent in the APD construct, the emergence of psychopathy as a more reliable method of identifying those at risk (Cunningham & Reidy, 1998a) has likely contributed to the paucity of research in this domain. In a meta-analysis of 39 studies regarding the prediction of institutional misconduct, Gendreau, Goggin, and Law (1997) identified a moderate relationship between prison misconduct and a nonspecific category of antisocial attitudes and behaviors. Somewhat vague in their description of this antisocial category, the authors indicated that it included several factors consistent with APD diagnostic criteria, including histories of previous institutional misconducts, substance abuse, nonrewarding relationships, and poor prison adjustment.

Warren, Burnette, et al. (2002) examined the relationship between personality disorders and institutional adjustment among 261 incarcerated female offenders. A diagnosis of APD was not significantly associated with a violent index offense or official records of violent institutional infractions; a similar pattern was demonstrated with individuals diagnosed with any Cluster B personality disorder. Interestingly, both categories were predictive of inmate self-reported violence while incarcerated. Female inmates diagnosed with APD reported the highest rate of perpetuated institutional violence, which the authors posited could be reflective of the APD group's ability to perpetuate covert violence or their ability to exaggerate their predatory tendencies.

Taken together, these results as well as the improved predictive capability afforded by psychopathy suggest that the presence of APD is not a useful construct in the prediction of institutional misconduct or violence in correctional settings. Given the high base rate of APD among offenders, a diagnosis of APD does little to distinguish offenders at risk, particularly given that most inmates do not commit a serious offense while incarcerated. Likewise, the utility of a categorical definition of APD (i.e., APD vs. non-APD) in distinguishing those most prone to institutional misconduct is further questionable because of the problem of innumeracy that was first described by Rogers and Dion (1991). That is, based on the immense variety of possible symptom combinations that could result in a diagnosis of APD (i.e., 397,683 unique symptom combinations; Cunningham & Reidy, 1998a), some authors have questioned whether a diagnosis of APD represents a discrete clinical entity that can reliably distinguish among individuals (Cunningham & Reidy, 1998a; Rogers, Duncan, Lynett, & Sewell, 1994). This caution appears to be particularly warranted in correctional settings, given that a majority of incarcerated offenders meet the threshold for a diagnosis of APD.

Age

The relationship between age and antisocial behavior is among the most well established in the criminological literature (Cunningham & Reidy, 1998b; Hirschi & Gottfredson, 1983). Although absolute crime rates fluctuate, a similar age-crime distribution can be found across different time periods and settings (Hirschi &

Gottfredson, 1983). For example, this pattern can be seen in arrest rates for violent and nonviolent crime in the United States during 2004, which peaked for individuals aged 25 to 29 and steadily declined as age increased (Federal Bureau of Investiation, 2005). Researchers have consistently demonstrated inverse relationships between age and general criminal behaviors (Gendreau et al., 1996; Hirschi & Gottfredson, 1983) as well as age and violent behaviors (Cunningham & Reidy, 1998b; Monahan et al., 2001; Quinsey et al., 2006; Swanson, Hollzer, Ganju, & Jono, 1990). Thus, it is not surprising that most actuarial risk assessments include age as a risk factor.

The age distribution of individuals incarcerated within U.S. and state correctional institutions follows a similar pattern to that seen in community arrest rates. Inmate age has been shown to be strongly associated with problematic institutional behaviors (Bureau of Justice Statistics, 2006). Researchers have consistently demonstrated an inverse relationship between age and institutional misconduct, such that younger age is associated with higher rates of general disciplinary problems (Alexander & Austin, 1992; Flanagan, 1985; Gendreau et al., 1997; Jensen, 1977; MacKenzie, 1987; McCorkle, 1995; Sorensen & Pilgrim, 2000; Sorensen & Wrinkle, 1996; Toch et al., 1987; Toch & Adams, 1986, 2002) and violent institutional infractions (Baskins et al., 1991; Cooper & Werner, 1990; Cunningham & Reidy, 1998b; Loza, 2003; Proctor, 1994; Sorensen & Wrinkle, 1996; Walters, 1998; Warren, Hurt, et al., 2002). Similar patterns have been found across male (Toch & Adams, 2002), female (Warren, Hurt, et al., 2002), and mixed gender samples (McCorkle, 1995). The strength of association has also been demonstrated to remain constant across infraction types (Baskin et al., 1991).

The consistency and strength of the association between age and institutional infractions has led some to argue that it is the strongest single predictor of future institutional violations (Toch et al., 1987; Toch & Adams, 2002). In an examination of mental health status and institutional behaviors of incarcerated male offenders, Toch et al. (1987) found strong interactions between mental illness and ethnicity in rates of disciplinary infractions; however, after incorporating several other factors into the analysis, the authors discovered that age accounted for the differences in infractions rate between ethnic groups. The majority of inmates identified as having a high number of infractions were found to be significantly younger than those inmates with few to no infractions, regardless of ethnicity. Similarly, McCorkle (1995) found age to be the strongest predictor of correctional institution disciplinary problems across gender and ethnic groups. Such results are consistent with longitudinal studies in the community, suggesting that the effect of age on crime is unaffected by ethnicity or gender (Hirschi & Gottfredson, 1983).

Researchers have demonstrated that, in general, the rate of institutional infractions decreases over the length of incarceration (Flanagan, 1983; Sorensen & Wrinkle, 1996; Toch & Adams, 2002; Zamble, 1992). Some authors have postulated that progressive aging across incarceration significantly contributes to this phenomenon (Cunningham & Reidy, 1998b; Flanagan, 1983). Antiauthoritarian attitudes and impulsivity, which are often associated with youth, have been implicated as potential moderators of the effect of age on institutional behaviors (MacKenzie, 1987; Toch et al., 1987). Nonetheless, given this strong association, researchers are well advised to take age into account when researching correctional institutional adjustment and misconduct.

Gang Affiliation

Although gangs have always existed within correctional settings, modern prison gangs are much larger, better organized, and more connected to the outside world than were gangs during previous time periods (Compton & Meacham, 2005). Estimates of the number of incarcerated offenders who are affiliated with a prison gang range from 6% (American Correctional Association, 1993) to 25% (Knox, 2000), and many authors have suggested that that rate of prison gang affiliation continues to be a growing problem (Fong, Vogel, & Buentello, 1996; Knox, 2000). Some have argued that the growth of the modern prison gang is a direct result of well-intended prison reforms that, in addition to establishing inmate rights, inadvertently eroded successful prison gang control mechanisms (Compton & Meacham, 2005; Fong & Vogel, 1995). Nonetheless, prison gangs, which are frequently referred to in the literature as security threat groups (STGs), remain a pervasive problem within U.S. correctional institutions (Gaes, Wallace, Gilman, Klein-Saffran, & Suppa, 2002), requiring increased resource allocation to effectively manage gang-affiliated inmates (Compton & Meacham, 2005).

Despite anecdotal evidence that gang-affiliated inmates create a greater institutional security risk than do those not affiliated with a gang, few researchers have systematically examined whether gang membership increases the likelihood of correctional institutional violations (Gaes et al., 2002). In an examination of the institutional behaviors of male offenders incarcerated within Arizona Department of Corrections facilities between 1994 and 2000, Fischer (2001) found that the rates of institutional infractions among inmates who were affiliated with street and/or prison gangs were two to three times higher than the rates for inmates not affiliated with a gang.

Members of certified prison gangs had the highest recorded rates of assaults, drug violations, rioting, weapons violations, and other violent institutional infractions. These results were consistent with a previous examination of individuals incarcerated within the Texas Department of Corrections in which gang-affiliated inmates were found to have significantly higher rates of solitary confinement placements for serious violations as compared with nonaffiliated inmates (Fong & Vogel, 1995).

In response to a paucity of research into prison gangs, particularly when compared to the larger research base concerning street gangs (see Decker & Van Winkle, 1996), Gaes et al. (2002) undertook a prospective examination of 82,500 male offenders incarcerated within U.S. Federal Bureau of Prison facilities. Similar to anecdotal reports, gang affiliation significantly increased the likelihood of violent misconduct, as well as most other forms of institutional infractions. These results held constant even after controlling for age, ethnicity, security level, and prior history of violence. The authors also examined the effect of gang embeddedness on institutional behaviors by examining various levels of prison gang affiliation, which consisted of full member status (i.e., core member), suspected status (i.e., thought to be a gang member, but credentials not fully established), associate status (i.e., conducted business or looked out for gang's interests, but had not joined gang because ethnicity, residence, or cultural background precluded full membership), and nonaffiliated status. As expected, full members were much more likely to commit violent infractions than peripheral affiliates, who in turn had greater rates of violence than nonaffiliated inmates.

Gaes et al. (2002) noted an interesting relationship between the amount of time affiliated with a gang and institutional violations: The amount of time affiliated with a gang was negatively associated with institutional misconduct, such that the longer an inmate was affiliated with a prison gang, the less likely he was to be cited for institutional violations. These authors hypothesized that the decrease in violations across time may have been due to more seasoned members taking on leadership roles that involved ordering affiliates to commit institutional infractions, rather than committing offenses themselves. Likewise, as part of initiation rituals, new members may be required to commit acts of violence; this may have accounted for the higher rates among new members. However, it is also possible that the longer an inmate was affiliated with a gang the greater the likelihood that he would come to the attention of institutional officials, who would in turn allocate increased resources to suppress the inmate's negative activities. Future research into this phenomenon is necessary to explore these hypotheses and to inform gang intervention strategies.

Given the strong anecdotal and empirical evidence that gang affiliation is associated with increased risk of violent and nonviolent institutional misconduct, researchers examining the institutional behaviors of incarcerated offenders are well advised to account for gang status. Nevertheless, further research is necessary to identify the specific aspects of gang affiliation that increase misconduct risk and to inform gang intervention programming. Likewise, future examination of female gang affiliates, and exploration into the specific risk factors for becoming affiliated with an STG once incarcerated are necessary to inform correctional administrators, officers, and policy makers.

Criminal/Violence History

A history of violent behavior has been described as the best single predictor of future violence (Monahan et al., 2001; Pinard & Pagani, 2001). Indeed, researchers have consistently found strong positive relationships between previous violence and violent recidivism in the community (Bonta et al., 1998; Loza & Dhaliwal, 2005; Monahan et al. 2001). Similarly, criminal history has been found to be among the most consistent and robust predictors of general criminal offending (Bonta et al., 1998; Gendreau et al., 1996; Klassen & O'Connor, 1994; Loza, 2003). The relationship between violent/criminal history and violent/criminal recidivism has been demonstrated among mentally ill and non-mentally ill offenders (Bonta et al., 1998) as well as previously hospitalized individuals (Monahan et al., 2001).

Investigations into the behaviors of incarcerated offenders have demonstrated a significant positive relationship between criminal history and institutional adjustment. In their meta-analysis of the predictors of general institutional misconduct among incarcerated offenders, Gendreau et al. (1997) found criminal history, as defined by prior criminal record, index offense, violence history, and history of escape, to be among the strongest predictors of future institutional misconduct. In addition, criminal record and violence history were significant predictors of institutional misconduct in isolation, with criminal history displaying the largest effect size among these variables. Cooper and Werner (1990) found the number of previous arrests and prior convictions to be significantly associated with violent misconducts during the first six months of incarceration with a sample of U.S. federal inmates; however, strong conclusions were hampered by a small sample size.

Although researchers have consistently demonstrated a strong positive association between overall criminal history and institutional adjustment, the relationship between past violent behaviors and institutional misconduct is less clear. In a large prospective examination of the institutional behaviors of incarcerated adult offenders in the New York prison system, Toch and Adams (2002) found a history of convictions for violent offenses to be moderately predictive of general institutional misconduct (i.e., violent and nonviolent infractions). Violence history added unique variance to the prediction of disciplinary misconduct, which provided evidence of a continuity of problematic behavior from the community to incarceration among these inmates. However, contrary results were demonstrated by Proctor (1994) in an evaluation of the U.S. federal prison system's classification model. Despite accounting for a significant proportion of variance in custody level, past violence was not a valid predictor of institutional misconduct.

Unlike research with community samples, an association between violence history and violent/physically aggressive institutional misconduct has yet to be demonstrated. That is, despite the significant associations found between general criminal history and violent and nonviolent institutional misconduct, as well as the strength of past violence as a predictor of violent recidivism among community samples, researchers looking into the relationship between violence history and future violent institutional infractions have found these two variables to be unrelated (Cooper & Werner, 1990). Similarly, although index offense (i.e., the most serious conviction that resulted in the current incarceration) has displayed weak associations with problematic institutional behaviors (Toch & Adams, 2002), researchers have found a violent index offense to be unrelated (Cunningham et al., 2005; Proctor, 1994) or negatively related (Flanagan, 1983; Toch &

Adams, 2002) to future violent and nonviolent institutional misconduct. For example, in an examination of violent institutional infraction rates among individuals incarcerated for murder, sex offenses, robbery, drug offenses, or property offenses, Cunningham et al. (2005) found all but one index offense (property crimes) to be statistically unrelated to violent institutional behaviors. Property crimes were positively associated with violent infractions, such that individuals who were incarcerated for property crimes were 1.5 times more likely to commit a violent infraction than were inmates convicted for other offenses.

In sum, it appears that an inmate's criminal history is associated with institutional adjustment in that the risk for general institutional misconduct increases as the extent of criminal history increases. However, these results have not generalized to violent institutional infractions. Although evidence with community samples strongly suggests that individuals who have committed previous violent acts are more likely to engage in aggressive behaviors than are individuals with no history of physical aggression, violence history has not been found to be related to violent infractions among incarcerated offenders. Moreover, inmates who are incarcerated for a violent offense are no more likely to engage in violent institutional behaviors than are offenders incarcerated for nonviolent offenses. In fact, inmates with a violent index offense may be less likely to engage in violent institutional behaviors than are inmates incarcerated for property crimes.

Environmental/Situational Factors

Environmental context is an important consideration when estimating risk for violent or antisocial behaviors (Cunningham & Reidy, 1998b; Loza, 2003). Although researchers have consistently agreed that situational factors play an important role in violence risk (Klassen & O'Connor, 1994), relatively few researchers have included explicit examination of situational variables in the prediction of violent behaviors (Monahan & Steadman, 1994). Investigations into factors associated with violent and antisocial behaviors in the community have been generally supportive of the influence of context. For example, researchers have demonstrated the quality of social support/networks (Estroff & Zimmer, 1994) and perceived stress (Monahan et al., 2001) to be related to violent/antisocial behaviors among mentally ill individuals. Given that correctional institutions are tasked with providing an environment conducive to the management and rehabilitation of inmates, it is not altogether surprising that researchers have hypothesized that factors associated with the prison environment impact the risk of disruptive and violent inmate behaviors (Loza, 2003; Toch et al., 1987; Walters, 1998; Wright, 1993).

Among correctional institution environmental factors hypothesized to be associated with problematic inmate behaviors, prison overcrowding has received the most empirical attention. Early research into the influence of correctional institution population density (i.e., calculated by dividing total population by institutional capacity; Ekland-Olson, Barrick, & Cohen, 1983) has identified a strong relationship between overcrowding and a host of negative consequences (Cox, Paulus, & McCain, 1984), including violent/disruptive institutional misconduct (Cox et al., 1984; Nacci, Teitelbaum, & Pranther, 1977). In a 33-month examination of the U.S. federal prison system, Gaes and McGuire (1985) demonstrated prison overcrowding to be an important determinant of assault rates across institutions. A positive association was found between overcrowding and assaultive behaviors, such that inmate assault rates increased and decreased concomitant with population density. In fact, population density was found to be the most influential variable in the prediction of assaultive behaviors among several predictors, including inmate age.

Although a direct relationship between prison overcrowding and problematic institutional behaviors was once considered to be "widely accepted" (Cox et al., 1984, p. 1149), more recent investigations have led some authors to conclude that any effect of overcrowding on disruptive/violent behaviors is a spurious association resulting from the influence of several potential mediating factors (Ruback & Innes, 1988). Ekland-Olson et al. (1983) studied the influence of population density on assaultive/disruptive institutional violent behaviors across Texas Department of Corrections facilities for a 4-year period. Finding the age distribution within an institution to be the best predictor of the institutional infractions, the authors concluded that institutional population density was not related to inmate assault rates or institutional violations. In fact, prison population size and institutional infractions were only significantly associated when the median age of an institution was 27 years or greater.

Walters (1998) undertook a systematic investigation of inmate assaults at one U.S. federal institution for a period of 9 years. Contrary to conventional wisdom and previous research, population density was found to be negatively correlated with inmate assault rates. That is, as the prison became more crowded, inmate violence actually reduced. Noting the complex relationship between institutional factors and problematic inmate behaviors, it was hypothesized that a negative feedback loop in which systematic compensatory systems in response to overcrowding (e.g., increased staff, additional staff training, and policy modification) may have been the cause of such counterintuitive findings. Walters further argued that social density (i.e., to what degree the prison population perceives overcrowding to be a problem) was an important factor that linked overcrowding and violent behaviors. In addition to highlighting the importance of systematic compensatory mechanisms in response to overcrowding, these results were supportive of previous authors' contention that the quality of administrative management of overcrowding is a key determinant of inmate violence (Ruback & Innes, 1988).

Gendreau et al. (1997) included prison situational factors in their meta-analysis of several predictors of correctional institution misconduct. Prison overcrowding was found to be only weakly associated with problematic inmate behaviors, despite having the greatest number of effect sizes under investigation. However, a somewhat vague category that combined several institutional factors (i.e., custody level, population demographics, per diem cost, security level, inmate turnover, and inmate-staff ratio) demonstrated a stronger association with disciplinary infraction than did any other predictor under examination, including age, criminal history, and antisocial attitudes. Although firm conclusions are tempered by the inclusion of relatively few institutional factor effect sizes, the results of the meta-analysis highlighted the importance of institutional factors beyond population density when assessing inmate risk.

Positing that the social climate of correctional institutions plays a significant role in inmate adjustment, Wright (1993) examined 942 randomly selected inmates within several New York State prisons. Contrary to common assumptions, Wright found program structure to be negatively associated with disruptive behaviors such that highly structured environments were associated with greater frequency of disruptive behaviors.

Although it was concluded that the greater personal control an inmate was able to assert the more successful his or her adjustment would be, it is possible that the greater scrutiny of inmate behavior associated with highly structured environments influenced this finding. Similar to self-efficacy, the availability of self-improvement opportunities, freedom, and privacy were negatively associated with problematic behaviors. Thus, Wright contended that prison administrators could facilitate inmate adjustment, including the reduction of disruptive inmate behaviors, through the development of policies promoting inmate self-efficacy.

Despite general consensus that environmental context plays an important role in antisocial and violent behaviors (Cunningham & Reidy, 1998b; Klassen & O'Connor, 1994; Loza, 2003; Monahan & Steadman, 1994), when compared to other predictors of violent/criminal risk, a paucity of research exists examining this relationship. Correctional research is well-suited for addressing the impact of situational factors on behavior because environmental controls are instituted daily in correctional systems. Preliminary research has generally been supportive of the influence of environment on problematic institutional behaviors; however, future research is necessary to further define the impact of specific situational factors on inmate behavior.

Major Mental Illness

Despite campaigns aimed at changing public perception, the number of community members who believe that individuals with major mental illness are at higher risk for violence than those in the general population has risen since the 1950s (Phelan & Link, 1998). Nonetheless, many researchers and advocates for the mentally ill have asserted that mental illness and violence are not meaningfully related (Monahan, 1991).

Attempts at empirically examining the validity of public fears that individuals with major mental illnesses represent a danger to society have resulted in little consensus among researchers. Likewise, as the research base has become more methodologically sound, it appears that early research may have led to premature conclusions (Arboleda-Flórez, Holly, & Crisanti, 1998).

In a review of 200 studies regarding the association between mental illness and crime, Monahan and Steadman (1983) found that, when controlling for age, gender, ethnicity, social class, and previous institutionalization, no relationship existed between mental illness and violent behavior. However, after reconsidering the decision to control for previous institutionalizations and social class, Monahan (1992) later contended that his previous declaration that no relationship existed between mentally illness and violent behaviors may have been premature. Although he continued to assert that the majority of mentally ill individuals are not violent, after examining more recent and more methodologically sound research that had not been included in his earlier analyses, Monahan concluded mental illness to be a modest risk factor for violent behavior. Similarly, Link and Stueve (1995) argued that little empirical evidence existed to support the assertion that mental illness and violence were *not* associated, and they described the relationship as one of causality.

Among the most compelling evidence that led Monahan (1992) to reconsider his earlier position regarding a relationship between mental illness and violent/criminal behavior was an investigation undertaken by Swanson et al. (1990). Utilizing data drawn from the National Institute of Mental Health's Epidemiological Catchment Area project (ECA; Robins & Regier, 1991), Swanson et al. examined psychiatric diagnosis and self-reported violent behavior among 10,059 individuals across three communities. The authors found that the frequency of self-reported violence was five times higher among individuals who met criteria for at least one psychiatric disorder (about 10% of the sample) than among those without diagnosable psychiatric symptomatology (2%). Similar rates of violence were found among individuals who were diagnosed with schizophrenia, major depressive disorder, and bipolar disorder. Similarly, substance abuse and the presence of comorbid diagnoses significantly increased risk of violence.

Following the seminal work of Swanson et al. (1990), additional researchers have identified significant relationships between mental illness and violent behavior in the community (Link, Andrews, & Cullen, 1992; Swanson, Borum, Swartz, & Monahan, 1996; Tehrani, Brennan, Hodgins, & Mednick, 1998). Although individuals with major mental illness have demonstrated higher rates of violent behaviors in the community, given the low base rate of violence in general, as well as the overall low percentage of individuals in the community who suffer from major mental illness, many have argued that the absolute risk of violence among the mentally ill remains low (Link & Stueve, 1995; Monahan, 1992; Swanson et al., 1990; Swanson, 1994). Likewise, researchers have argued that in-depth examination of the specific features of major mental illness that are associated with increased risk of violence, as well as of the social context in which violence among the mentally ill occurs, is necessary to shed light on the relationship between major mental illness and violent behavior (Link & Stueve, 1995; Monahan, 1992; Teplin et al., 1994).

After finding current and former psychiatric patients to be significantly more likely to have a history of violent behavior than individuals without a psychiatric treatment history, Link et al. (1992) found the presence of psychotic symptomatology to be the only variable that accounted for the difference between groups. Subsequent analyses further demonstrated that a subset of psychotic symptoms, specifically beliefs that others are able to control one's mind (i.e., control-override symptoms) and beliefs that others possess malicious intent (i.e., threat symptoms), were most associated with the increased risk of violence among mentally ill individuals in the community (Link & Stueve, 1994). In order to further examine the relationship between psychotic symptoms and violent behavior in the community, Swanson et al. (1996) reanalyzed the ECA data (from Swanson et al., 1990) to include threat/control-override psychotic symptoms (TCO) in the analysis. Consistent with Link and Stueve (1994), Swanson et al. (1996) found the presence of TCO symptoms to be associated with an increased risk of violence. Individuals endorsing TCO symptoms were twice as likely to have exhibited violent behavior than were those endorsing non-TCO psychotic symptomatology and five times more likely than those with no psychiatric disorder to have committed a violent act. Additionally, the probability of violence was greatest among those who exhibited both TCO symptoms and major mental illness. Further evidence has suggested that both the threat and control-override components are independently related to violent behavior and that the combination of both components is superior to either individual component in the prediction of violence behavior (Link, Stueve, & Phelan, 1998).

Although conceding that the risk of violence among mentally ill individuals in the community is low, some have argued that failure of community advocates to acknowledge any relationship between violence and major mental illness may have served to slow the destigmatization of mental illness (Bloom, 1989; Monahan, 1992).

However, others have argued that causal inferences regarding the relationship between major mental illness and violence are premature due to the serious methodological flaws that are inherent in addressing such a complex phenomena (Arboleda-Flórez et al., 1989). In a review of available research, Arboleda-Flórez et al. (1998) concluded that the combined effects of selection bias, failure to consistently control for key confounding variables (e.g., age, gender, and ethnicity), overlapping definitions across many mental disorders and violence, and a paucity of prospective research designs have precluded casual statements. Likewise, some researchers have argued that better defined comparison groups were necessary before firm conclusions regarding the relationship between mental illness and violence could be reached (Arboleda-Flórez et al, 1998; Quinsey et al., 2006; Rice & Harris, 1992).

Indeed, an influx of more recent and more methodologically sound research has cast doubt on conclusions regarding a direct link between major mental illness and violence in the community (Bonta, Law, & Hanson, 1998; Monahan et al., 2001; Rice & Harris, 1992; Steadman et al., 1998; Teplin et al., 1994). Arguing that previous researchers have failed to sufficiently separate criminal behavior from psychiatric diagnosis when evaluating risk for criminal and violent behaviors, Rice and Harris (1992) compared released insanity aquittees who were matched according to age, index offense, and criminal history. Comparing individuals who met criteria for schizophrenia with individuals who did not meet diagnostic criteria, the authors found that individuals diagnosed with schizophrenia were significantly less likely to have committed any offense upon release. Likewise, an examination of post-release offenses suggested that those diagnosed with schizophrenia were less dangerous upon release. The best predictors of general and violent recidivism were found to be the same as those found among non-mentally ill offenders (i.e., offense history, age, alcohol abuse, and a history of aggressive behaviors). Similarly, Quinsey et al. (2006) reported that the presence of schizophrenia was negatively correlated with future violence among released forensic patients in the development of the Violence Risk Appraisal Guide (VRAG; Quinsey et al., 1998, 2006).

In a six-year longitudinal examination of released jail detainees, Teplin et al. (1994) found that, after controlling for age and prior violent crimes, the presence of major mental illness did not increase the probability of being arrested for a violent offense over that of non-mentally disordered offenders. Suggesting that mental disorder is a construct too heterogeneous to allow reliable prediction of violence, Teplin et al. advocated for future examination of the role of specific symptoms in assessing violence risk. Nonetheless, similar to Rice and Harris (1992), the results suggested that past violent crime was the most robust predictor of future violent crime, irrespective of psychiatric status. These results were further supported by a meta-analysis of 35 predictors of violent and general recidivism undertaken by Bonta et al. (1998). Finding parity between mentally ill and non-mentally ill offenders, the authors argued that knowledge about general offender risk assessment can be applied to mentally disordered offenders. As with non-mentally ill offenders, adult criminal history and juvenile delinquency were the most potent predictors of recidivism among mentally ill offenders.

In an attempt to undertake a large-scale prospective study of the risk factors of violent behavior among mentally ill individuals that would improve upon the methodological limitations found in most prior research, Monahan et al. (2001) examined a wide array of factors and multiple measures of violent behavior. Considered by many to be a seminal undertaking, the MacArthur Risk Assessment Study examined individuals who had been admitted and released from multiple psychiatric facilities, tracking their post-discharge behaviors for a period of 2 years. Several researchers utilizing the MacArthur data have demonstrated results in opposition to cause-and-effect conclusions regarding mental illness and violent behavior in the community. Steadman et al. (1998) found the rate of violence among mentally ill individuals released from psychiatric hospitals to be similar to the rates of non-mentally ill community members. As with previous studies, the presence of a substance abuse disorder significantly increased violent behavior among both groups, with mentally ill individuals with co-occurring substance abuse displaying the higher rates of violence.

Similarly, Monahan et al. (2001) found the presence of major mental illness without a co-occurring substance to be negatively correlated with post-discharge violence. A diagnosis of schizophrenia was also found to be negatively associated with violence, whereas diagnoses of mania or depression were not significantly related to violent behavior. Likewise, when examining clusters of diagnoses, the presence of a major mental disorder was associated with a significantly lower rate of violence than a diagnosis of “other mental disorder” (e.g., adjustment or personality disorders).

Although conceding that psychotic symptoms can precipitate violent acts in individual cases, researchers have recently provided evidence that the presence of delusions and other psychotic symptoms are not predictive of higher rates of violence (Appelbaum, Robbins, & Monahan, 2000; Bonta et al., 1998; Monahan et al., 2001). These findings have remained consistent even after the type and content of delusions were taken into account, including TCO symptoms. For example Appelbaum et al. (2000)

were only able to successfully replicate the previously identified associations between TCO symptoms and violence (e.g., Link & Stueve, 1994) after changing their study design to include the methodological limitations of previous studies (e.g., making the design retrospective and including non-delusional symptoms in the definition of TCO symptoms). Moreover, the positive association appeared to be due to a general non-delusional suspiciousness, which was eliminated after controlling for anger and impulsiveness. Similarly, in an examination of the relationship between hallucinations and violence, Monahan (2001) found that neither general nor command hallucinations were associated with a higher risk of violence; however, more consistent with conventional wisdom, command hallucinations that instructed individuals to commit violent acts were associated with elevated risk of violence.

To conclude, the past three decades have resulted in a plethora of research into the association between violence and major mental illness in the community. Although researchers have demonstrated mixed findings and have argued opposing positions, it is apparent that the relationship between major mental illness and violent behavior is complex. This relationship is further complicated by a multitude of confounding variables that must be taken into account before drawing firm conclusions. For example, researchers have consistently found rates of violence to be significantly higher among mentally ill individuals with co-occurring substance abuse disorders (Monahan, 2001; Monahan et al., 2001; Rice & Harris, 1992; Steadman et al., 1998; Swanson et al., 1990, 1996; Swanson, 1994). Future research employing methodologically sound designs and large sample sizes, such as the MacArthur Risk Assessment Study, would be helpful in further delineating the complex relationship between major mental illness and violent behavior in the community.

Major Mental Illness in Incarcerated Populations

Looking specifically at the behaviors of incarcerated offenders, the relationship between major mental illness and institutional misconduct, including violent offenses, appears to be much clearer than the previously discussed research regarding individuals in the community. State and federal prisons house a growing number of offenders with mental illness (Council of State Governments, 2002). Incarcerated offenders have significantly higher rates of major mental illness than individuals in the community (Arboleda-Flórez et al., 1998; Fazel & Danesh, 2002). Although most states have created specialized psychiatric confinement facilities that specialize in the housing and treatment of severely mentally ill offenders, such resources are limited, resulting in about two-thirds of those inmates who receive mental health services being housed in facilities that do not specialize in psychiatric confinement (Bureau of Justice Statistics, 2001). Incarcerated mentally ill offenders have greater difficulty adjusting to confinement than non-mentally ill offenders, which creates increased problems for prison staff and requires prison administrators to invest greater resources to effectively manage the institution (Toch & Adams, 1987; DiCataldo, Greer, & Profit, 1995).

The interaction between problematic intuitional behaviors and psychopathology has been coined the disturbed-disruptive pattern, and some researchers have posited that mental illness and disruptive behavior in prison settings are interconnected (Toch & Adams, 2002). Indeed, researchers have consistently demonstrated that, in general, incarcerated mentally ill offenders have displayed higher rates of disciplinary infractions than have incarcerated individuals without identified psychiatric treatment needs (Adams, 1983, 1986; Baskin, Sommers, & Steadman, 1991; McShane, 1989; Morgan, Edwards, & Faulkner, 1993; Toch & Adams, 1986, 2002; Toch et al., 1987; Warren, Hurt, et al., 2002). This pattern has held constant for violent behaviors (Basking et al., 1991; Toch & Adams, 1986; Warren, Hurt, et al., 2002) and general disruptive behaviors (DiCataldo et al., 1995; McShane, 1989; Toch & Adams, 2002). Researchers have also demonstrated a positive relationship between mental illness and disruptive institutional behaviors when examining specific diagnostic groups such as Schizophrenia (Morgan et al., 1993), and after comparing individuals who have received mental health services while incarcerated with those who have not (Adams, 1986; Toch & Adams, 2002; Toch et al., 1987). Likewise, similar conclusions have been reached across male (Adams, 1983, 1986; DiCataldo, Greer, & Profit, 1996; Toch & Adams, 1986), female (Warren, Hurt, et al., 2002), and mixed gender samples (Baskin et al., 1991; Morgan et al., 1993). Finally, the relationship between mental illness and disruptive behavior among incarcerated offenders has remained constant even after controlling for variables that have previously been associated with criminal and violent behavior (e.g., age, criminal history, marital status, and education).

Although major mental illness has consistently been associated with increased rates of violent and disruptive behaviors, further discussion regarding mental illness and institutional adjustment is warranted. Some authors have suggested that higher rates of disruptive behaviors among mentally ill inmates may be due to a propensity among mentally ill offenders to engage in rule violations that are reflective of their symptomatology, rather than of malicious intent to cause a disturbance. After finding that mentally inmates were more likely than non-mentally inmates to be involved in institutional infractions, Adams (1986) discovered that the majority of disciplinary offenses among mentally ill inmates appeared to be indicative of symptomatic behavior. Mentally ill inmates were significantly overrepresented in infraction categories such as refusing to leave one’s cell and neglect of personal hygiene self-injury, which was hypothesized to be a sign of the environmental withdrawal and isolation that is often observed in individuals with serious mental illness. Similarly, Adams found significantly higher rates of property damage, self-injury, and fire setting among mentally ill inmates than in inmates without identified mental health problems, and he conceptualized such behaviors as expressions of rage and despair used to gain assistance from correctional staff.

Investigating potential differences in the institutional behaviors of disruptive mentally ill inmates and disruptive non-mentally ill inmates, McShane (1989) found significant differences in the rate of offenses committed by each group. Consistent with Adams’s (1986) research, mentally ill inmates displayed higher rates of institutional infractions hypothesized to be reflective of symptomatic behavior, including property damage, creating a disturbance, and vulgar language. Group differences were also found for the most serious offenses, with mentally ill inmates displaying higher rates of staff assaults and weapon possessions compared to inmates without an identified mental illness; however, no differences between groups were found for inmate assaults, escape attempts, violating an order, or rule disobedience. Given the higher rates of disturbance and staff assaults among mentally ill offenders, it is not surprising that they are perceived less favorably and as being more out of control than non-mentally ill inmates by correctional officers, who have overwhelmingly endorsed a desire for additional training in dealing with mentally ill inmates (Kropp, Cox, Roesch, & Eaves, 1989).

Although the majority of researchers who have examined the relationship between mental illness and correctional institution adjustment have included statistical controls for the effects of gender and ethnicity, others have investigated the influence of gender and ethnicity on the relationship between mental illness and institutional infractions. Researchers have demonstrated that ethnic minority inmates have higher rates of rule violations (McCorkle, 1995; Toch et al., 1987), including violent offenses (Warren, Hurt, et al., 2002), than ethnic majority inmates. Likewise, McCorkle (1995) found that gender and ethnicity interacted in the frequency of institutional infractions, with mentally ill Black females having the highest rate of violations. However, other researchers have found no significant differences between ethnicities in the frequency and severity of rule violations (McShane, 1989). Additionally, consistent with prior research in the community (e.g., Pavkov, Lewis, & Lyons, 1989), diagnostic discrepancies across ethnicities have also been noted among incarcerated offenders. Toch et al. (1987) found that Black male inmates were significantly more likely to be diagnosed with Schizophrenia than were White or Hispanic male inmates, whereas White inmates were most likely to be given a mood or anxiety disorder diagnosis. Nonetheless, given the dearth of research in this area, further examination is necessary before firm conclusions regarding the presence and/or cause of racial disparities can be made.

The rates of disciplinary infractions tend to peak soon after admission to correctional environments and steadily decline over the course of incarceration (Sorensen & Wrinkle, 1996; Toch & Adams, 2002; Zamble, 1992). Although mentally ill individuals display higher rates of institutional misconduct than do non-mentally ill inmates, some researchers have provided evidence that this discrepancy may disappear over the course of incarceration (DiCataldo et al., 1995). Finding that the frequency of institutional infractions among mentally ill inmates gradually became similar to non-mentally ill inmates over time, DiCataldo et al. (1995) hypothesized that early disruptive behaviors may have prompted mental health services and more lenient responses from correctional staff, which in turn facilitated eventual adaptation to the correctional environment.

Guyton, Haun, and Arnaut (2006) found that institutional adjustment among inmates who displayed symptoms of major mental illness differed depending on mental health treatment status. When comparing individuals who had been identified as seriously mentally ill by prison mental health staff to a matched sample of non-mentally ill inmates, the authors found that mentally ill inmates (as defined by the presence of a chronic/major mental illness) obtained fewer disciplinary infractions over the first 18 months of incarceration. However, when comparing individuals who endorsed symptoms consistent with major mental illness on the PAI to inmates who did not, those inmates who endorsed symptoms of major mental illness at the time of intake displayed higher rates of disciplinary infractions over the first 18 months of incarceration than individuals who did not endorse symptoms of major mental illness on the PAI. When comparing mental health status as defined by the PAI to status derived from mental health evaluation outcomes, Guyton et al. found an overall mental health classification discrepancy of 38% between evaluation modality, such that 45% of inmates endorsing symptoms of major mental illness on the PAI were not identified as mentally ill by prison staff. The lack of mental health intervention among these potentially mentally ill inmates may have explained the higher rates of institutional infractions among those who endorsed symptoms of major mental illness on the PAI.

Overall, it appears that the presence of major mental illness is a risk factor for disruptive and violent behavior in correctional environments. Such findings highlight the importance of accurate mental health screening and appropriate mental health services to promote not only the wellbeing of mentally ill inmates but also safety and security within correctional institutions. However, as has been undertaken in the examination of mental illness and violence in the community, further research is necessary to examine the specific features of mental illness that are associated with problematic behaviors among incarcerated offenders. Such endeavors would be helpful to prison administrators, correctional officers, and prison mental health professionals in the identification, management, and treatment of misconduct prone mentally ill offenders.

Methods of Forecasting Risk for Institutional Misconduct and Violence

Kroner and Mills (2001) identified three factors to be considered when assessing the practical utility of risk appraisal methods: (a) the predictive accuracy of a measure/prediction scheme, (b) its utility to provide information beyond risk estimates to assist population management and policy making, and (c) the cost and ease of completing the instrument/prediction scheme. In this section, research regarding the accuracy, utility, and practicality of several measures and prediction schemes in the classification of risk for institutional violence and misconduct is reviewed. Risk appraisal methods are organized according the primary method of information gathering (i.e., actuarial and objective/self-report methodologies). Relative strengths and weaknesses of each methodology and specific measure/prediction scheme with incarcerated populations are addressed. Finally, methodological issues associated with the forecasting violent and disruptive institutional behavior and researching risk appraisal methods in correctional environments is discussed.

Actuarial Methods

More than 50 years have passed since Meehl (1954) first argued that actuarial methods of prediction were superior to clinical judgment. In more recent reviews and meta-analyses comparing these two methods, statistical/actuarial methods of prediction have continued to consistently outperform clinical methods (Grove & Meehl, 1996; Grove, Zalad, Lebow, Snitz, & Nelson, 2000). Over the past 20 years, in response to growing need within the criminal justice system, several measures that incorporate actuarial methods have been developed specifically for the prediction of violent behavior (Borum, 1996; Kroner & Mills, 2001; Loza & Dhaliwal, 2005). Although few actuarial measures have been developed for the specific purpose of predicting violent behaviors among incarcerated offenders, researchers have recently begun to investigate the application of measures of violent recidivism in the community to the institutional behaviors of incarcerated offenders. Research regarding the use of several actuarial methods to assess risk for violent and disruptive behaviors among incarcerated populations is reviewed below. Because research regarding the use of the PCL and PCL-R with correctional populations was addressed in a previous section, neither measure is included in the following discussion.

Level of Service Inventory (LSI)

The Level of Service Inventory (LSI; Andrews, 1982), as well as its revised versions (the Level of Service Inventory-Revised, LSI-R, Andrews & Bonta 1995; and the Level of Service Inventory-Ontario Revision; LSI-OR, Andrews, Bonta, & Wormith, 1995), are among the most well-researched of risk/need assessment instruments (Gendreau et al., 1996). Originally developed to assist probation officers in the supervision of released offenders (Girad & Wormith, 2004), the LSI/LSI-R is used to aid in the assessment of criminal risk and supervision and treatment needs (Kroner & Mills, 2001; Loza, 2003; Mills, Jones, & Kroner, 2005). Constructed from a social learning perspective, focus is placed on personal history and social interactions (Kroner & Mills, 2001; Mills et al., 2005). The LSI-R is comprised of 54 items that assess 10 areas of risk/need, including educational history, criminal history, substance use, and family/marital interactions (Loza, 2003). LSI-R scores place an offender within one of five levels that reflect the probability of re-offending within 1 year (Mills et al., 2005), with higher scores indicating a greater likelihood of release failure. Psychometric evaluations have given evidence of adequate psychometric properties among incarcerated offenders (Loza & Simourd, 1994).

Several empirical investigations have found strong associations between the LSI-R and general and violent recidivism among released offenders. In a meta-analysis of static and dynamic predictors of general criminal recidivism, Gendreau et al. (1996) found that the LSI-R was a strong predictor of general recidivism, displaying effect sizes that were consistently superior to the PCL-R. Subsequent researchers have demonstrated high utility of the LSI-R in the prediction of general criminal recidivism (Kroner & Mills, 2001; Loza & Loza-Fanous, 2001). In a comparison of several actuarial measures, Kroner and Mills (2001) found no statistical differences among the LSI-R, the Violence Risk Appraisal Guide (VRAG; Harris, Rice, & Quinsey, 1993), the HCR-20 (Webster et al., 1995), the Lifestyle Criminality Screening Form (LCSF; Walters, White, & Denney, 1991), and the PCL-R in the prediction of violent or general criminal recidivism among released male violent offenders; however, the LSI-R displayed the strongest correlations with violent and total convictions. A validation study of the LSI-OR produced similarly robust correlations with general and violent recidivism at a 31-month follow-up among male Canadian offenders (Girard & Wormith, 2004).

Responding to Hare's (1998) contention that failure to assess psychopathy when predicting offender risk is tantamount to professional negligence, Gendreau, Goggin, & Smith (2002) undertook a meta-analysis of PCL-R and LSI-R effect sizes in the prediction of general and violent recidivism. Refuting claims by some researchers that the PCL-R is an unparalleled risk prediction measure (e.g., Salekin et al., 1996), the authors found that the LSI-R outperformed the PCL-R in the prediction of both general and violent recidivism across studies. When analyzing studies that directly compared these two measures, Gendreau et al. found that the LSI-R outperformed the PCL-R in the prediction of general recidivism and they demonstrated similar performance by the two measures in the prediction of violent recidivism. However, Mills et al. (2005) cautioned that the violent recidivism probabilities generated by actuarial risk assessments, including the LSI-R, may not generalize across to other samples. Despite performing better than the VRAG probability categories for violent recidivism, the LSI-R probability categories consistently underestimated the likelihood of general recidivism when applied to a sample demographically different from the validation sample.

Given the promising findings for the LSI-R in the prediction of general and violent recidivism among released offenders, some researchers have examined the ability of the LSI-R to predict institutional misconduct among incarcerated offenders. Bonta and Motiuk (1992) found the LSI to be moderately associated with institutional misconduct, including assaultive behavior, among incarcerated male Canadian offenders. Although the strength of relationship decreased after factoring out the variance accounted for the number of days incarcerated, the association between LSI scores and problematic institutional behaviors remained significant. These results were consistent with a previous study by these authors that demonstrated a higher rate of institutional misconduct among inmates with high LSI scores (Bonta & Motiuk, 1990). In their comparison of the utility of several actuarial measures in the prediction of general recidivism, Kroner and Mills (2001) also examined the institutional behaviors of a sample of incarcerated Canadian male offenders. Similar to findings on post-release criminal recidivism, no statistically significant differences were found between the VRAG, HCR-20, PCL-R, LCSF, or LSI-R for prediction of major or minor institutional violations, with the LSI-R demonstrating moderate correlations with major and minor disciplinary infractions.

In a meta-analysis of the correlates of correctional institutional misconduct, Gendreau et al. (1997) found the LSI-R to be a strong predictor of institutional violations. The LSI-R displayed the greatest predictive validity when compared to the MMPI and several state correctional classification procedures in the prediction of institutional misconduct. However, as previously discussed, methodological limitations, including significant amounts of missing data across examined studies, preclude strong generalizations from the Gendreau et al. meta-analysis.

The preliminary findings discussed in this section suggest that the LSI-R may be a useful measure in the assessment of the institutional risk and classification; however, further research is warranted before firm conclusions can be made. Research across jurisdictions is needed; in particular, the utility of the LSR-I with non-Canadian offenders remains largely unexamined (Hollin, Palmer, & Clark, 2003).

Violence Risk Appraisal Guide (VRAG)

The development of the VRAG represented an effort to reduce existing research regarding actuarial variables in the prediction of violent recidivism into a single actuarial measure that would accurately predict future violence (Quinsey et al., 2006). Developed with Canadian male offenders, the VRAG consists of 12 independent variables that independently added to the prediction of violent recidivism, with the PCL-R reflecting the most heavily weighted item (Harris et al., 1993). Other positively weighted variables include elementary school maladjustment, early parental separation, prior release failures, a history of alcohol abuse, and the presence of a personality disorder. Variables found to have an inverse relationship with violent behaviors, such as the presence of schizophrenia and offender age (Harris, Rice, & Cormier, 2002), are negatively weighted, resulting in a total possible score ranging from -27 to 35. To assist in the generation of cutoff points, scores are broken down into nine equal groupings that produce a probability for violent re-offending within 7- and 10-year periods (Quinsey et al., 2006).

On the basis of available evidence, Harris et al. (2002) boasted that the VRAG had matched or surpassed all methods of prediction of violent recidivism, stating that all examinations have resulted in a positive relationship between VRAG scores and violence. Indeed, researchers have demonstrated strong associations between VRAG scores and future recidivism at times ranging from 4.5 to 7 years (Barbaree, Seto, Langton, & Peacock, 2001; Glover, Nicholson, Hemmati, Bernfeld, & Quinsey, 2002; Harris, Rice, & Cormier, 2002; Hilton et al., 2001). However, the VRAG has also demonstrated accuracy in the prediction of violent recidivism in time frames ranging from as short as 20 weeks (Harris, Rice, & Camilleri, 2004) to as long as 10 years (Rice & Harris, 1997). Strong effect sizes in the prediction of violent recidivism have been found across a variety of settings and samples, including mentally ill (Harris et al., 1993, 2002) and non-mentally offenders (Glover et al. 2002), spousal abusers (Hilton et al., 2001), and civilly committed individuals (Harris et al., 2004). Likewise, researchers have demonstrated associations with general criminal recidivism (Glover et al., 2002; Kroner & Mills, 2001; Loza, Villeneuve, & Loza-Fanous, 2002).

Despite the well-established relationship between the VRAG and future violent and criminal acts in the community, few researchers have attempted to examine the utility of the VRAG in the prediction of prison behaviors. In their comparison of actuarial measures in the prediction of institutional misconduct among male Canadian offenders, Kroner and Mills (2001) found no statistically significant differences in the performance of the VRAG, HCR-20, PCL-R, LCSF, and LSI-R. Displaying moderate predictive validity, the VRAG demonstrated the strongest relationship of the assessment instruments with both major and minor institutional violations among measures. However, in examining the utility of the VRAG for a sample of incarcerated Scottish offenders, Cooke, Michie, and Ryan (2001, as cited in Cunningham et al., 2005) reported a high rate of misclassification in the prediction of institutional aggression. According to

Cunningham et al., these authors found a false positive rate of 64% when using median VRAG scores as a cutoff.

Overall, the VRAG is among the most well-validated violence risk assessment instrument available. However, although it is potentially useful in correctional settings, additional research is needed to assess its utility with incarcerated offenders. Particularly, the relationship between some risk factors and violence in the community may not follow similar patterns among incarcerated offenders, which is likely to affect the validity of VRAG item weightings in correctional settings. For example, although the authors have demonstrated an inverse relationship between the presence of schizophrenia and community violence, research among incarcerated populations has demonstrated higher rates of institutional misconduct among inmates diagnosed with schizophrenia when compared to a matched sample of non-mentally ill inmates (Morgan et al., 1993). Future researchers must also address the generalizability of findings across samples, because the validity of the VRAG in the prediction of misconduct among U.S. inmates has not been investigated. Moreover, given that the probability categories associated with the VRAG validation sample have been found to overestimate the likelihood of re-offending when applied to different samples in the community (Mills et al., 2005), the appropriateness of VRAG violence probabilities with correctional populations is suspect.

HCR-20

The HCR-20 was designed for the purpose of assessing violence risk among psychiatric and correctional populations (Douglas & Webster, 1999). Items were selected on the basis of a comprehensive literature review and the "clinical wisdom of some experienced clinicians" (Borum, 1996, p. 949), resulting in a 20-item instrument that includes both static (historical) and dynamic (changeable) variables. The HCR-20 is composed of three scales that make up the total score. The Historical Scale (H) is composed of 10 primarily static variables that are unlikely to change over time (Douglas & Webster, 1999), including past violence, age, personality disorder, psychopathy, and relationship instability. The Clinical Scale (C) is made up of five items regarding current emotional, psychiatric, and mental functioning, all of which are considered dynamic and malleable in nature (Douglas, Oglof, Nicholls, & Grant, 1999). The remaining five items make up the Risk Management Scale (R), which is concerned with forecasting an individual's response to future circumstances (Douglas & Webster, 1999). Similar to the PCL-R, each HCR-20 is scored on a 0-2 scale, with a 2 indicating that the factor assessed is present. Each item is equally weighted; consequently, the weight of the H Scale is equal to the combined weight of the S and R Scales.

Since its inception, several researchers have examined the validity of the HCR-20 in the prediction of violent behaviors. Although moderate validity in the prediction of general and violent recidivism among released offenders has been demonstrated (Kroner & Mills, 2001), the majority of researchers examining the HCR-20 have been concerned with the behavior of psychiatric patients. Researchers have established modest to large associations between HCR-20 scores and post-discharge violent behavior (Dernevik, Grann, & Johansson, 2002; de Vogel & de Ruiter, 2005; Douglas et al., 1999; Nichols, Ogloff, & Douglas, 2004; Tengstrom, 2001) and psychiatric institutional violence (McKenzle & Curr, 2005; McNiel, Gregory, Lam, Binder, & Sullivan, 2003, Nichols et al., 2004). However, some authors have noted gender differences in the utility of the HCR-20 in predicting inpatient and post-discharge behavior among male and female psychiatric patients (de Vogel & de Ruiter, 2005; Nichols et al., 2004). Likewise, direct comparison of HCR-20 scales suggest that each scales' predictive power may vary according to whether it is being used for short- or long-term prediction (Douglas et al., 1999; McKenzle & Curr, 2005; McNiel et al., 2003), such that historical items may be most predictive of chronic risk whereas the clinical items are more strongly associated with acute risk (McNiel et al., 2003).

Utilizing a retrospective design with 75 Canadian male offenders, Douglas and Webster (1999) were the first to examine the HCR-20 among incarcerated offenders. Moderate to large associations were found between Total Score and prior violent offenses, with the Historical Scale displaying the greatest postdictive validity. Upon examination of prior violent institutional violations, median Total Score demonstrated an odds ratio of 2.5; that is, an offender who had committed a violent institutional offense was 2.5 times more likely to score above the median on Total Score. Although historical items displayed the strongest correlations with prior violent offenses in the community, the Clinical Scale was found to have the highest odds ratio for prior institutional violence (3.3).

In a prospective examination of the association between the HCR-20 and PCL:SV and institutional behaviors among a random sample of 41 incarcerated Swedish offenders, Belfrage et al. (2001) reported high predictive validity for the clinical and risk management items in the prediction of institutional violence. Little support was found for historical items, with the exception of prior supervision failures. However, although the authors identified their findings as predictive, their use of a group difference research design did not actually permit predictive statements. That is, the use of Mann-Whitney U significance testing addressed group differences between the median scores of offenders who committed institutional violence and those who did not. Thus, significant differences were found between offenders who committed violent infractions and those who did not, such that violators displayed significantly higher Clinical and Risk Management Scale scores than non-violators. No difference between groups was found when examining the Historical Scale.

In a prospective study of institutional aggression, Cook et al. (2001, as cited in Cunningham et al., 2005) demonstrated moderate predictive validity of the HCR-20 with a sample of 180 incarcerated Scottish offenders. Kroner and Mills (2001) found a less robust association between the HCR-20 Total Score and major institutional infractions in their comparison of actuarial measures. Although no statistically significant differences were found in predictive validity across measures, the relationship between the HCR-20 and major infractions was small. However, HCR-20 performance improved for the prediction of minor infractions, displaying a moderate association.

Some commentators have argued that, although potentially useful, the current paucity of evidence regarding the utility of the HCR-20 in the prediction of institutional behaviors of incarcerated offenders precludes widespread use (Cunningham et al., 2005; Cunningham & Reidy, 2002). Such cautions are warranted pending further cross-validation efforts and are particularly relevant to the use of the HCR-20 in U.S. prisons, given that no such study has been undertaken to date. Moreover, only one empirical study that examined a U.S. sample was found in the entire literature on the HCR-20, further questioning current use with individuals within the U.S. criminal justice system.

Actuarial Instruments Developed for Predicting Correctional Institution Misconduct

Several measures have demonstrated utility in the assessment of static and dynamic factors associated with correctional institutional adjustment, many of which have subsequently been employed in correctional settings. Likewise, correctional institutions employ a wide variety of inmate classification systems to assist in placing inmates in the most appropriate settings and services. Although inmate risk and security needs are an important consideration of classification systems, other internal management needs must also be addressed, including mental health status and treatment needs, post-release needs, and rehabilitation and educational needs (Clements, 1996). The most well-validated inmate classification schemes include several of the previously discussed correlates of intuitional misconduct (see Clements, 1996; Van Voorhis, 1994; Van Voorhis & Brown, 1996). Nonetheless, few instruments have been developed for the specific purpose of assessing and predicting risk of institutional misconduct and violence among incarcerated offenders.

Addressing juror misperception that convicted murders are much more likely than other types of offenders to commit violent acts while incarcerated, Sorensen and Pilgrim (2000) examined the potential threat posed by capital murder defendants to correctional staff and other inmates. Noting a very low base rate of violent acts among male inmates incarcerated for murder in Texas, the authors estimated that after 9 years of incarceration only 11% of convicted murders would have committed a violent act while incarcerated. To aid in prediction, Sorensen and Pilgrim identified six factors associated with violence among their sample: involvement of a contemporaneous burglary or robbery associated with the murder, contemporaneous attempted murder, multiple victims, gang membership, previous prison incarceration, and age. Based on the number of risk factors present for a convicted murderer, the authors were able to generate a probability of engaging in a violent misconduct over 40 years of incarceration. The probability categories associated with the number of risk factors ranged from 6.8% for inmates who exhibited one of the six risk factors to 43.3% for those who met all six risk factors. It was estimated that only 2% of those over the age of 35 and who had none of the other aggravating factors would commit a violent act over the course of 40 years of incarceration.

Seeking to extend the approach applied by Sorensen and Pilgrim (200) to a wider spectrum of maximum security inmates, Cunningham et al. (2005) developed a research tool termed the Risk Assessment Scale for Prison (RASP). Maximum security male inmates incarcerated in Missouri (N = 2,505) were retrospectively examined across an 11-year period. Incorporating predictors that were found to be associated with prison violence among this sample, Cunningham et al. included age, prior incarceration, previous probated sentences, education, and time served in the final model. Placing inmates into 1 of 10 probability groupings of ascending violence risk, the estimated RASP probabilities were similar to the actual observed base rates of violent behavior associated with each bin. Strong predictive validity was achieved across inmate types (AUC = .719), with modest to strong effect sizes being found across parole eligible, life without parole, and death sentenced inmates.

Notwithstanding the impressive results demonstrated with the RASP, some cautions should be noted. Foremost, given the retrospective design employed by Cunningham et al. (2005), prospective examination into the relationship between the RASP and prison violence is necessary before validity can be established. Because the mean time incarcerated across the sample was 3.41 years and because an increased false positive rate was demonstrated as violence probability increased, the authors suggested that the probabilities associated with this scale are likely to be most accurate at periods of 3 to 4 years. Although initial evidence for the RASP is promising, future investigations with a greater variety of offender types and across jurisdictions are necessary before the RASP could be responsibly implemented into clinical practice.

Objective/Self-Report Measures

Wang et al. (1997) recommended that, given the range of potentially problematic behaviors and psychopathology that correctional staff must consider, mental health screening instruments in correctional settings must assess response style and Axis I and Axis II symptomatology. This necessity for practical measures that assess a wide range of behaviors and psychopathology has led to widespread use of multiscale self-report inventories in correctional classification (Edens, Cruise, & Buffington-Vollum, 2001). Many such inventories contain individual scales that assess constructs related to the previously identified correlates of problematic institutional behaviors. In this section, the evidence regarding the utility of two commonly employed multiscale inventories in correctional risk assessment is reviewed. Evidence regarding the utility of the PAI in the prediction of institutional misconduct and violence, which is a major focus of this study, will be reviewed in more detail in a later section.

Minnesota Multiphasic Personality Inventory (MMPI)

Since its inception, the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943) has remained the most widely used objective measure of personality (Nichols, 2001). Training in the administration and interpretation of the MMPI and the more recent second edition (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) is considered to be an critical task of clinical psychology training programs (Belter & Piotrowski, 2001; Watkins, Campbell, Nieberding, & Hallmark, 1995) because the MMPI-2 has been identified as the psychological instrument most often employed by practicing psychologists (Piotrowski & Belter, 1999; Watkins et al., 1995). The MMPI-2 consists of 567 true-false items that require an eighth-grade reading level to complete. Although individual items contribute to several validity, clinical, content, and supplemental scales and subscales used to assess a wide variety of personality traits, the standard MMPI-2 scales are made up of 3 validity and 10 clinical scales (Nichols, 2001). Scores for each scale are converted to *T*-scores, which allows for interscale comparisons and the generation of percentile rankings.

Reflective of its popularity in clinical practice, as of the 1990s the MMPI/MMPI-2 was the most frequently researched clinical instrument (Butcher & Rouse, 1996). Likewise, since its inception, the MMPI has been frequently researched and utilized by the criminal justice system. In addition to its robust utility as a correctional mental health screening instrument, some have argued that when used in conjunction with other narrowband measures of dangerousness (e.g., LSI-R or PCL-R), the MMPI-2 can make a contribution to correctional risk assessment (Megargee, 2006). However, although MMPI/MMPI-2 scale elevations have been found to be associated with previous criminal and violent offending among incarcerated males (Osberg & Polland, 2001; Valliant, Gristey, Pottier, & Kosmyna, 1999), the results of several examinations have suggested little practical utility in the prediction of institutional violence or other types of disciplinary problems within correctional settings (Cunningham & Reidy, 1998b; Cunningham et al., 2005).

The most frequently cited MMPI-based offender classification system is the Megargee MMPI typology (Megargee & Bohn, 1979), which was derived from an 8-year examination of federally incarcerated male offenders (Kennedy, 1986). Designed for the purpose of classifying incarcerated youthful and adult offenders, the Megargee system places offenders into 1 of 10 typologies on the basis of common MMPI profile configurations (Van Voorhis, 1994). In a review of applicable research, Zager (1988) found strong reliability across Megargee classification categories. Classification rule adaptations were undertaken with male (Megargee, 1994) and female (Megargee, 1997) offender populations to ensure the applicability of MMPI-2 profile configurations.

Although researchers have suggested that Megargee typologies are associated with treatment-related outcomes (Van Voorhis, 1994) and may be useful in assisting inmate housing decisions (Kennedy, 1986), the results of several investigations have shed doubt on the utility of Megargee typologies in the prediction of violent and disruptive institutional behaviors. In an examination of the MMPI profiles of 524 randomly selected male federal inmates, Louscher, Hosford, and Moss (1983) found that Megargee typologies did not generalize well to a sample of maximum-security inmates. Moreover, Megargee typologies were not effective in the prediction of institutional adjustment or problematic institutional behaviors. Similar results were obtained by Hanson, Moss, Hosford, and Johnson (1983), who found only one Megargee typology to be significantly related to indicators of institutional adjustment among incarcerated male offenders.

Noting that inmate MMPI profiles changed substantially during the first year of incarceration, Carey, Garske, and Ginsgberg (1987) sought to limit the examination period from the 12 months undertaken by previous researchers to a 6-month follow-up that would reflect the initial adjustment of newly incarcerated offenders. Employing a prospective approach in the examination of the Megargee system with a sample of 503 male offenders incarcerated in Ohio, Carey et al. found Megargee typologies predicted official institutional disciplinary write-ups, the number of nights in administrative segregation, and mental health service utilization. However, when that the system's predictive validity was examined according to ethnicity, striking differences were found between White and Black participants, such that Megargee typologies were only reliable when applied to White participants. Although Black participants were younger and had lower educational achievement and IQ scores than White inmates, statistically controlling for these variables did not improve prediction among Black participants. Echoing concerns regarding the predictive validity of the MMPI with non-Caucasian offenders, Zager (1988) called for further research into racial differences in offender classification.

In a comprehensive comparison of five classification systems, Van Voorhis (1994) examined the utility of the Megargee system with 369 male federal inmates incarcerated in either a medium-security penitentiary or a minimum-custody prison camp. Finding few significant correlations with disciplinary problems, the author described the failure of the Megargee system to predict various indices of disciplinary problems as "disappointing" (p. 131). Speculating that the inclusion of invalid profiles may have skewed the results, the author completed a secondary analysis, excluding all profiles with problematic validity scores; however, this exclusion did not affect the previous results, prompting Van Voorhis to conclude that "predicting disciplinary-related rather than treatment-related variables simply may not be one of the strengths of this system, particularly in this setting" (p. 132).

In addition to MMPI/MMPI-2 profile configuration strategies such as the Megargee system, researchers have investigated the relationship between institutional behaviors and individual MMPI/MMPI-2 scales. Originally developed to be to be reflective of asocial/amoral psychopathy (Nichols, 2001), elevations on the Psychopathic Deviate Scale (Pd) have been most frequently associated with antisocial and violent behaviors. Quay (1984) examined Pd elevations of 1,824 incarcerated federal inmates and found significant differences between groups classified according to hostility and aggression. Individuals who were classified as exhibiting the highest degree of aggressiveness displayed significantly higher Pd elevations than did those ranked low on aggressiveness. However, although a statistically significant difference was found between groups, the results offered little practical benefit in the identification of offenders prone to institutional aggression for two reasons: Only 6 points separated *T*-scores for the highest and lowest aggression groups, and a high degree of overlap between Pd scale distributions was noted across groups (Cunningham & Reidy, 1998b).

Carbonell, Megargee, and Moorhead (1984) demonstrated similar results in the examination of 1,157 federally incarcerated male offenders. Although significant correlations were found between the F, K, Pd, Schizophrenia (Sz), Mania (Ma), Social-Introversion (Si), and First Factor (A) scale scores and various indictors of institutional adjustment, the authors found Pd to be the only scale reliably associated with institutional infractions and days spent in disciplinary segregation. Because the absolute values of statistically significant coefficients were quite low, Carbonell et al. suggested that individual MMPI scales were unlikely to be of practical use in individual decision making. Similarly, noting that Pd elevations are prototypical of incarcerated populations, Cunningham and Reidy (1998b) further questioned the utility of Pd elevations in the identification of inmates most prone to violent and disruptive institutional behaviors. That is, similar to the discussion of APD, because the majority of incarcerated offenders are likely to display clinical elevations on Pd, the scale is unlikely to reliably differentiate those offenders who commit violent infractions from those who do not.

Noting the difficulties inherent to the rapid classification of newly incarcerated offenders, Jemelka, Wiegand, Walker, and Trupin (1992) developed a computer-based interpretation system (CBTI) to assist in the classification of offender mental health status, institutional violence risk, and risk of victimization. MMPI scale and subscale scores were included with a number of other variables that were examined in the development and validation of the CBTI with 100 incarcerated male offenders. Using institutional infractions as their outcome, Jemelka et al. employed a multiple stepwise regression that yielded an eight-variable equation to classify individuals into one of five groups according to risk of infraction. Four MMPI scales were included in the final equation: Ma and F displayed positive associations with institutional infractions, whereas the depression clinical (D) and content (DEP) scales were negatively associated with problematic institutional behaviors. When the final equation was used to classify 762 newly incarcerated male offenders, mean general and violent infraction rates between groups followed the expected direction, with those classified as high risk with the CBTI displaying the highest rates of infractions after 18 months of incarceration.

Schaffer, Walters, and Adams (1994) employed a discriminant analysis in the examination of 150 incarcerated male offenders, half of whom had committed a violent institutional infraction within the previous 6 months. MMPI scales F and Hypochondriasis (Hs), as well as juvenile arrest history, marital status, violence history, and history of hospitalization, were included in the final coefficient. Unfortunately, the authors did not report actual variable weightings or correlations, limiting any discussion regarding the specific association between F and Hs and institutional violence. Classification of the sample with this discriminant function resulted in an impressive true positive rate of 76% for violent participants. However, because the authors used an artificial violence base rate of 50% to maximize predictive efficiency, implementation of this classification scheme would likely result in significant false positives because the base rate of violent offending is much lower than 50% in correctional settings. Highlighting the difficulty of accurately predicting low base rate events, Jemelka et al. demonstrated that a violence base rate of 16%, which was the actual base rate of violent offending in the settings from which their sample was derived, would have only correctly identified 33% of violent inmates.

Researchers have often developed additional MMPI scales in the hopes of increasing the range of clinical constructs assessed. Megargee and Carbonell (1985) examined relationships among eight scales that were deigned to assist correctional decision makers and institutional adjustment: Panton's Adjustment to Prison Scale-Revised (AP-R; Panton, 1958), the Prison Maladjustment Scale (PMS; Wattron, 1963), the Habitual Criminalism Scale (HC; Panton, 1962a), the Religious Identification Scale (RI; Panton, 1979), Homosexuality (HX; Panton, 1960), Escape (Ec; Beall & Panton, 1956), the Recidivism Scale (RC; Clark, 1948), and the Parole Violation Scale (PaV; Panton, 1962b). Employing a large sample of 1,214 federally incarcerated male offenders, Megargee and Carbonell found the Ec and HC scales to be weakly correlated with the rate of institutional infractions. Likewise, all scales, with the exception of HX, were weakly correlated with the number of days spent in disciplinary segregation. The authors concluded that, although some statistically significant relationships were found, the absolute magnitude of associations were too low to be of assistance in the prediction of institutional adjustment.

In a meta-analysis of the predictors of institutional misconduct among incarcerated offenders, Gendreau et al. (1997) examined 29 separate MMPI effect sizes across a combined number of 17,636 participants. The LSI-R and a combined group of correctional classification systems were most predictive; the MMPI was found to be weakly associated with prison misconduct. However, interpretive conclusions on the basis of this meta-analysis are limited because, in addition to the methodological limitations previously discussed regarding this study, Gendreau et al. combined all MMPI coefficients into one combined effect size without discussing individual MMPI scale weightings. Thus, it is possible that the effects of individual MMPI scales were suppressed when combined with scales that displayed lower associations with prison misconduct.

Overall, despite several empirically validated uses in the assessment and classification of correctional populations, the MMPI does not appear to be useful in the prediction of problematic institutional behaviors. Research on individual scales has resulted in mixed findings in the prediction of institutional misconduct, with findings that were significant providing little practical utility. Moreover, the widely researched Megargee MMPI-based classification system has performed poorly in the prediction of disciplinary problems.

Interestingly, little research was found on the MMPI-2 in correctional settings, even though the test has been in circulation for over 15 years. It is possible that updated norms and scale revisions of the MMPI-2 would result in stronger associations with institutional misconduct. Likewise, as with all research into correlates of future antisocial/violent behaviors, MMPI effect sizes were suppressed by low base rates of offending. More sophisticated analyses, such as survival analyses or receiver operating characteristics, could provide useful information. Thus, although research to date has been disappointing, future research with the MMPI-2 should be undertaken before strong conclusions regarding the relationship between MMPI/MMPI-2 scales and institutional adjustment can be made.

Millon Clinical Multiaxial Inventory (MCMI)

The Millon Clinical Multiaxial Inventory (MCMI; Millon, 1981) is an objective multiscale measure that was designed to assist clinical decision-making through the assessment of a variety of personality traits and psychopathology (Choca, 2004). Widely applied in clinical and educational settings (Belter & Piotrowski, 2001; Piotrowski & Belter, 1999; Watkin et al., 1995), the MCMI and its revisions, the MCMI-II (Millon, 1987) and the MCMI-III (Millon, Millon, & Davis, 1994; Millon, Davis, & Millon, 1997), allow for both categorical and dimensional assessment of psychological constructs

(Choca, 2004). Composed of 175 true-false items that make up 24 clinical scales (10 clinical scales, 11 basic personality scales, and 3 severe personality scales; Kelln, Dozois, & McKenzle, 1998), MCMI-III raw scores are converted to a standardized base rate score that indicates the probability that an examinee possesses the construct being measured (McCann & Dyer, 1996). A base rate score of 75 was set as the point at which the characteristic being measured is definitely present, with a score of 85 indicating that the characteristic is primary for the individual (Choca, 2004).

Several hundred empirical investigations have been undertaken with the MCMI and they have generally supported its use as a diagnostic instrument for a wide variety of clinical syndromes and personality disorders (see Craig, 1997, for a review of MCMI empirical literature). In addition to widespread use with psychiatric populations, the MCMI has been found useful in the assessment of certain disorders and/or behaviors, including drug and alcohol dependence (Craig & Weinberg, 1992a, 1992b), eating disorders (Norman, Blais, & Herzog, 1993), and spousal abuse (Beasley & Stoltenberg, 1992). Likewise, researchers have demonstrated diagnostic accuracy with the MCMI computerized interpretation system (Moreland, & Onstad, 1987).

Although adequate psychometric properties have been demonstrated with the MCMI and MCMI-II (Craig, 1997), several researchers have expressed concerns regarding the psychometric properties of the MCMI-III. Because over half of the MCMI-III items were rewritten or replaced, questions have been raised regarding the generalizability of research with previous versions of the MCMI to the MCMI-III (Blais et al., 2003; Marlowe, Festinger, Kirby, Rubenstein, & Platt, 1998; Piersma & Boes, 1997), leading some to conclude that the MCMI-III may "operate like a 'new' instrument rather than merely a revised edition" (Marlowe et al., 1998, p. 16). In an examination of the criterion validity of the MCMI-III, Retzlaff (1996) utilized data provided in the MCMI-III manual (Millon et al., 1994) to generate the operating characteristics of the initial validation study. Positive predictive power (PPP) values were found to be poor across scales, ranging from .00 to .32 for personality disorders and .15 to .58 for Axis I disorder scales. Examination of median PPP across all scales suggested that scale elevations would result in erroneous diagnosis in over 80% of cases. Nonetheless, citing strong reliability, similarities to earlier versions, and the use of clinician ratings as a criterion, Retzlaff (1996, 2000) suggested that the poor performance of the MCMI-III was likely due to a weak validation study, rather than problematic test validity.

The MCMI-III has recently gained prominence as a forensic tool (McCann, 2002). However, much debate has been undertaken regarding the admissibility of MCMI-III findings in court proceedings, resulting in little consensus. Combining the results of three studies, including the original validation study (Millon et al., 1994), Rogers, Salekin, and Sewell (1999) demonstrated low convergent validity and problematic discriminant validity across several MCMI-III scales. Citing poor construct validity and high error rates, Rogers et al. concluded that the MCMI-III did not meet the standard set forth for the admissibility of scientific evidence (i.e., *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 1993; hereafter cited as *Daubert*).

Rogers and colleagues (1999) have been criticized for failing to include a more recent and methodologically sound validation study undertaken in revision of the MCMI-III (Millon et al., 1997), which some have asserted would have led to different conclusions (Dyer & McCann, 2000; Retzlaff, 2000). Although not explicitly advocating that the MCMI-III met the *Daubert* standard, Dyer and McCann (2000) asserted that serious methodological problems of the Rogers et al. study limited any conclusions. Nonetheless, Rogers, Salekin, & Sewell (2000) reaffirmed their position, contending that the identical interscale correlations that were noted for both the original and revised MCMI-III suggested no differences in construct validity. Likewise, they argued that the increase in PPP for the revised version of the MCMI-III was likely reflective of a lax criterion, rather than constituting evidence of predictive accuracy. However, on the basis of literature review and case examples, others have maintained that the MCMI-III qualifies for admissibility under *Daubert* (Schutte, 2001). Needless to say, future research and court rulings are necessary to solve this controversy.

Although widely used in prison environments (Millon & Millon, 1997), relatively few empirical investigations have been undertaken with the MCMI or its revisions in correctional settings (Retzlaff, Stoner, & Kleinsasser, 2002). Likewise, few researchers have examined the utility of the MCMI in the prediction of institutional behaviors. Kelln et al. (1998) employed a prospective design with 128 male Canadian offenders who completed the MCMI-III during their admission to a Canadian federal institution. Tracking official institutional reprimands (considered a less severe consequence than institutional violations) and behavioral penalties associated with institutional misconduct (i.e., disciplinary segregation, early lock-ups, monetary penalties, and days of program suspension) for an average of 9 months, these authors found that the MCMI-III increased predictive accuracy of institutional reprimands and behavioral penalties beyond demographic information alone (i.e., age, ethnicity, index offense, and sentence length). No individual MCMI-III scales were significant in the prediction of institutional reprimand; however, seven scales were significantly predictive of subsequent behavioral penalties: Schizoid, Antisocial, Aggressive, Compulsive, Passive-Aggressive, Borderline, Alcohol Dependence, and Thought Disorder. No information was provided regarding the objectivity of the institutional system for assigning behavioral penalties, which may have affected the results. Although of limited practical utility in the prediction of specific institutional behaviors (e.g., assaultive behaviors vs. disobedience of an order), the results provided initial support for the utility of the MCMI-III in the prediction of institutional behaviors.

In a large prospective examination of incarcerated offenders, Retzlaff et al. (2002) investigated the utility of individual MCMI-III scores in the prediction of institutional charges of assault. Problematic institutional behaviors among 9,468 participants were tracked for an average of 20 months following the administration of the MCMI-III, which was administered as part of the Colorado Department of Corrections intake proceedings. Of the 24 MCMI-III scales, significant differences were found between participants who were subsequently charged with at least one assault while incarcerated and those who did not receive assault charges during the study period on 13 scales, 12 of which reflected higher scores for those with assault charges. Odds ratio calculations ranged from 1.3 to 2.8, with the Delusional (2.8), Narcissistic (1.9), Sadistic (1.8), Antisocial (1.7), and Schizoid (1.7) scales displaying the highest effects. Thus, individuals who were charged with at least one assault were 2.8 times more likely to obtain a high score on the Delusional scale (e.g., base rate score $\geq$ 75). The Compulsive scale was the only scale for which individuals who were not charged with an assault scored higher than those who were charged (0.4). Given the large sample size and prospective methodology undertaken by Retzlaff et al., these results may have some practical utility in the identification of individuals at greater risk for assaultive institutional behaviors; however, because the authors did not report assault base rate information or mean MCMI-III scale elevations, the practical utility of the MCMI-III in the prediction of assaultive behaviors remains unclear.

An important consideration when applying objective measures in correctional settings is the required reading level of any instruments. A major limitation of the MCMI-III in correctional settings is the required eighth-grade reading level, which likely results in a large portion of inmates remaining untested. In order to address this deficiency, a correctional version of the MCMI-III (MCMI-III-C; Millon & Millon, 1997) was created that adjusted item wording, resulting in a fourth-grade reading requirement. In addition, the MCMI-III-C was normed entirely with incarcerated individuals and, in addition to the standard MCMI-III scales, the interpretive report incorperates six paragraphs specific to correctional environments, including reaction to authority, violence and suicide risk, amenability to treatment/rehabilitation (Millon & Millon, 1997). Although a correctional form has been available since the inception of the original MCMI (Millon & Millon, 1997), no empirical investigations were identified that included correctional forms of the MCMI, including the MCMI-III-C.

Although the results of the described research is promising regarding the use of the MCMI-III in the identification of inmates at risk for institutional misconduct, more research is necessary given that only two studies were identified that were specifically designed to examine the MCMI-III and institutional adjustment. Moreover, validation efforts with the MCMI-III-C should be undertaken, which could result in great utility within correctional settings. In addition, future research is necessary that addresses potential psychometric problems of the MCMI-III, and cross-validation efforts examining the generalizability of MCMI/MCMI-II findings to the MCMI-III are recommended.

Objective Measures Designed for Use within the Criminal Justice System

In addition to measures of general personality traits and psychopathology, researchers have developed objective measures designed specifically for use with forensic and correctional populations, many of which have subsequently been applied in the prediction of institutional adjustment.

Psychological Inventory of Criminal Thinking Styles (PICTS). The PICTS (Walters, 1995) is an objective self-report measure designed to assess eight thinking patterns that have been hypothesized to be associated with a criminal lifestyle, such as entitlement, externalizing blame, desire to achieve power and control over others, and poor critical reasoning skills (Walters & Geyer, 2005). Composed of 80 Likert-type items that make up eight nonoverlapping thinking style scales and two validity scales, the PICTS has demonstrated adequate psychometric properties with both male and female offenders (Walters & Elliot, 1999; Walters, 1995, 1996, 2002). Subsequent factor analyses have supported the inclusion of four factor scales conceived in the initial validation of the PICTS (Walters, 2005a): Problem Avoidance, Interpersonal Hostility, Self-Assertion/Deception, and Denial of Harm. Finally, two component scales that are obtained via a weighted combination of three scales were designed to assess the degree to which criminal thinking is reactive or proactive (Walters & Geyer, 2005).

Reflective of its growing research base, Walters (2002) undertook a review and meta-analysis of the available PICTS literature. In addition to supporting previous investigations that attested to the psychometric strengths and factor structure of the PICTS, Walters (2002) demonstrated significant effect sizes across PICTS scales in the prediction of future criminal justice outcomes, which included general criminal recidivism, correctional institutional infractions, and program compliance. In the first of two studies included in the meta-analysis regarding institutional adjustment, Walters (1996) found the PICTS Power Orientation scale to be significantly predictive of future disciplinary infractions after controlling for age. Similarly, among a sample of 100 female offenders, Walters and Elliot (1999) found five individual PICTS scales to be significantly related to future disciplinary reports after controlling for age and race: Cutoff, Entitlement, Power Orientation, Cognitive Indolence, and Discontinuity.

Three studies regarding the utility of the PICTS in the prediction of institutional adjustment have been undertaken since Walters' (2002) meta-analysis. In an examination of the construct validity of the PICTS in relation to the PAI, Walters and Geyer (2005) investigated the relationship between institutional infractions and the PICTS composite scales among a sample of 199 federally incarcerated male offenders. Supportive of their hypothesis that institutional misconduct would be associated with reactive criminal thinking, the authors found the Reactive Scale (R) to be positively related to the total number of infractions and whether or not an individual committed an aggressive infraction; the Proactive Scale (P) was not significantly related to institutional infractions. These results remained constant after controlling for age, education, and index offense. Supportive of the role of reactive criminal thinking styles in institutional misconduct, Walters (2005b) found the R scale to be predictive of aggressive and total number of infractions after controlling for age, education, and prior disciplinary infractions.

Walters (2006a) attempted to cross-validate earlier findings with a sample of federally incarcerated male offenders who were enrolled in correctional programming addressing criminal thinking/lifestyle. Contrary to previous research with general population offenders, only the Cutoff Scale was significantly associated with subsequent aggressive, nonaggressive, and total number of infractions at 24 months post PICTS administration. The author hypothesized that the lack of statistical significance found among most scales was likely due to a restricted range of outcomes. That is, individuals who were actively enrolled in correctional programming were much less likely to commit an institutional infraction than general population inmates. Nonetheless, Walters contended that the relationship between Cutoff Scale elevations (which are associated with impulsivity, irresponsibility, and anger) and institutional infractions provided support for skill-based intervention programs in reducing problematic institutional behaviors.

Psychopathic Personality Inventory (PPI). The development of the PPI (Lilienfeld & Andrews, 1996) represented an attempt to create an objective self-report measure that would assess the core personality characteristics associated with psychopathy. Because most self-report measures assessed antisocial behaviors, Lilienfeld and Andrews (1996) sought to create a measure that would facilitate empirical comparisons between personality and behavioral approaches to the assessment of psychopathy. The PPI consists of 187 Likert-type items on eight subscales that assess various personality traits associated with psychopathy (e.g., egocentricity, fearlessness, cold-heartedness, and stress immunity) and three validity scales (Sandoval, Hancock, Poythress, Edens, & Lilienfeld, 2000). Researchers have demonstrated adequate psychometric properties of the PPI (Sandoval et al., 2000), and comparisons with the PCL-R have suggested that the PPI assesses constructs similar to the PCL-R (Poythress, Edens, & Lilienfeld, 1998). Factor analyses have resulted in a stable two-factor model similar to the PCL-R (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; Patrick, Edens, Poythress, Lilienfeld, & Benning, 2006), although minor differences have been demonstrated (Berardino, Meloy, Sherman, & Jacobs, 2005). Recent cross-validations efforts have resulted in promising findings regarding the use of the PPI with female offenders (Berardino et al., 2005; Chapman, Gremore, & Farmer, 2003).

The PPI has demonstrated positive associations with previous antisocial behaviors among individuals in the community (Benning et al., 2003) and forensic patients (Kruh et al., 2005), and has been found to be highly correlated with a measure of aggression among incarcerated offenders (Sandoval et al., 2000). In addition to the previously reviewed investigations that showed significant relationships between PPI total score and institutional infractions (see section above; Edens et al., 1999; Edens, Poythress, et al., 2001), Patrick et al. (2006) examined the relationship between PPI factors and institutional misconduct among 89 male offenders incarcerated in a Florida correctional facility. Similar to findings for the PCL-R, PPI Factor 2 scores were significantly associated with physically aggressive and verbally aggressive infractions, whereas Factor 1 was not significantly associated with either index of aggression. Both factors were similarly associated with nonaggressive infractions.

Self-Appraisal Questionnaire (SAQ). The SAQ (Loza, 1996) is an objective self-report instrument that was designed to predict violent and nonviolent recidivism among adult male offenders (Loza, Neo, Shahinfar, & Loza-Fanous, 2005). Composed of 72 true-false items that make up eight subscales, including one validity scale, the SAQ was developed to assess constructs that have been found to be associated with violent and nonviolent recidivism, such as criminal tendencies, conduct problems, and antisocial attitudes (Loza, Dhaliwal, Kroner, & Loza-Fanous, 2000). Psychometric investigations have demonstrated acceptable psychometric properties (Loza et al., 2000, 2005; Loza, Conley, & Warren, 2004) and SAQ scores have been found to be predictive of violent and nonviolent recidivism among Canadian male offenders at periods of two years post release (Kroner & Loza, 2001; Loza & Loza-Fanous, 2000, 2001). In fact, two empirical investigations have shown the SAQ to be equivalent to several well-established risk assessment measures, including the VRAG and PCL-R, in the prediction of violent and nonviolent recidivism at two years post release (Kroner & Loza, 2001; Loza & Loza-Fanous, 2001).

Given the positive results that have been demonstrated in the prediction of violent and nonviolent recidivism, it is not surprising that researchers have begun to assess the utility of the SAQ in the prediction of correctional institutional adjustment. Loza and Loza-Fanous (2002) examined the institutional behaviors of 303 Canadian male offenders for a period of 24 months following the administration of the SAQ. Among the six SAQ subscales that were included the analysis, all but one (Criminal History) were significantly related to whether or not a participant experienced any of six indicators of problematic institutional behaviors (e.g., days in segregation, severe infractions, etc.). The Criminal Tendencies subscale and the SAQ total score were significantly related to all six indicators of negative conduct. In a retrospective examination of the criminal and institutional histories of 86 male offenders incarcerated in North Carolina correctional institutions, Loza, Conley, and Warren (2004) found elevated SAQ total scores to be significantly related to number of prior arrests, criminal offenses, and criminal convictions. Similarly, the SAQ total score was found to be moderately correlated with the number of institutional infractions.

Taken together, these results suggest that, although the SAQ has demonstrated significant associations with institutional misconduct, additional prospective studies are necessary. Likewise, additional cross-validation efforts with non-Canadian samples and female offender groups are recommended.

The Use of Self-Report Instruments with Forensic and Correctional Populations

The implementation of objective self-report measures in the assessment of offenders provides several advantages to clinicians and prison administrators. Given the regular influx of inmates in state and federal facilities (Bureau of Justice Statistics, 2004), self-report measures provide an efficient and convenient method for assessing and classifying inmate risk and security levels. When compared to actuarial risk appraisal methods, self-report methods are more economical in that they require less time to administer and often do not require highly trained professionals to administer and interpret them (Kroner & Loza, 2001; Loza & Dhaliwal, 2005). The amenability of self-report measures to group administration, as well as the use of computer scoring software, increase the efficiency of offender assessment over that of more traditional risk appraisal measures (Kroner & Loza, 2001; Walters, 2006b). Likewise, because internal mechanisms, such as belief systems, expectancies, and attitudes, are presumed to be involved in problematic behaviors, self-report methods represent the only method that can provide insight into an individual's internal experience (Walters, 2002, 2006b).

Despite these strengths, many have expressed strong skepticism regarding the use of self-report techniques in the assessment of forensic and correctional populations (Kroner & Loza, 2001; Mills, Loza, & Kroner, 2003; Walters, 2002, 2006b). The most often cited concern is the susceptibility of self-report methods to intentional response distortion (Edens, Hart, Johnson, Johnson, & Oliver, 2000; Walters, 2006b). Because offenders are presumed to be less than forthright to avoid responsibility or punishment and to gain privileges (Walters, 2002, 2006b), overreliance on self-report methods can result in inaccurate conclusions, particularly when dealing with individuals rated high on psychopathy (Edens et al., 2000). However, as argued by Walters (2006b), the inclusion of validity scales found on many self-report measures compensates for this weakness by allowing clinicians to identify deceitful response patterns. Nonetheless, even the inclusion of validity scales remains unlikely to identify the savviest of simulators.

Inmate literacy is an important factor one must consider when evaluating the utility of a self-report measure for correctional populations. Low educational attainment and literacy rates are common among incarcerated individuals. According to the Bureau of Justice Statistics (2003b), 26% to 40% of individuals incarcerated in U.S. state and federal facilities have not obtained a high school diploma or GED, with 12% to 15% having obtained less than a ninth-grade education. Similarly, in examination of Canadian offenders, Muirhead and Rhodes (1998) found that 68% of incarcerated individuals could not read above an eighth-grade level, with almost 20% of participants reading at or below a fifth-grade level. Many self-report measures, such as the MMPI and the MCMI-III, require reading levels greater than a large percentage of offenders possess (i.e., eighth grade or higher; Edens et al. 2000; Kroner & Loza, 2001; Millon & Millon, 1997), thus limiting their utility in correctional settings given the low literacy rate of incarcerated offenders,

In response to this problem, many offender specific inventories have been developed with offender literacy rates in mind, resulting in acceptable reading levels for use in forensic and correctional settings. Likewise, the advent of multiscale inventories that require lower reading levels, most notably the PAI (which has a fourth-grade reading level) has resulted in greater applicability of self-report measures with incarcerated populations. Similarly, Walters (2006b) argued that the creation of theoretically derived measures (e.g., PICTS, SAQ, PPI, etc.) and scales (e.g., PAI Antisocial Scale; ANT) has addressed prior criticisms of poor content validity that were aimed at empirically derived self-report measures (e.g., MMPI; Edens et al., 2000). That is, the item content of such *content-relevant* scales and measures has been found to be theoretically relevant to the constructs they were designed to assess.

In order to determine whether assumptions regarding the superiority of traditional risk appraisal procedures when compared to self-report measures in the prediction of criminal justice outcomes (i.e., recidivism, institutional adjustment, and violent outcomes) were supported by empirical findings, Walters (2006b) recently undertook a meta-analysis of 22 prospective studies that included one or more self-report measure and at least one traditional risk appraisal measure (e.g., VRAG, PCL-R, HCR-20, LSI-R, etc.) in prediction of criminal justice outcomes. Contrary to popular belief that self-report methods are inherently flawed in forecasting antisocial and violent behaviors, Walters found that self-report measures performed as well as risk appraisal measures in the prediction of correctional institutional adjustment. Although risk appraisal procedures were moderately superior to self-report measures in the prediction of post-release recidivism, when risk appraisal procedures were compared to content-relevant self-report measures (i.e., those designed for use with forensic/correctional populations, such as PAI ANT; PICTS, and SAQ), no statistical differences were found in the prediction of recidivism. Walters reported parallel results with comparing content-relevant self-report methods with risk appraisal strategies, such that "self-report inventories designed specifically for criminal and antisocial populations perform on par with the best risk appraisal procedures" (p. 204). Further supporting the use of self-report strategies, self-report inventories displayed incremental validity relative to risk appraisal procedures in more than half of all comparisons.

Overall, despite reservations among clinicians and researchers, the appropriate implementation of offender self-report strategies in the identification of inmates at greater risk for antisocial and violent institutional behaviors appears to be an appropriate strategy, particularly when using self-report measures designed specifically for use with forensic and correctional populations. However, given that all measures are not equal in regard to their ability to forecast institutional behaviors, it is imperative that clinicians and prison administrators remain current in their knowledge of empirical findings and the potential limitations of self-report methods with correctional populations before implementing any self-report measure.

Personality Assessment Inventory

The Personality Assessment Inventory (PAI; Morey, 1991) has grown in popularity among clinicians and researchers since its development over 15 years ago (Belter & Piotrowski, 2001; Piotrowski, 2000; Piotrowski & Belter, 1999). Described early on as a worthy competitor to the MMPI-2 in the assessment of psychopathology and personality traits (Kavan, 1995), a rapidly growing research base has demonstrated the PAI to be a useful diagnostic tool across a variety of populations and settings (Morey, 1996; 2003). This section begins with a description of the rationale and development of the PAI. Its psychometric properties and relative strengths and weaknesses when compared to other multiscale personality inventories are discussed. A review of research regarding the use of the PAI with forensic and correctional populations is undertaken, with special emphasis on utility for the assessment and/or prediction of violent and antisocial behaviors. Finally, conclusions are drawn regarding the practicality of the PAI in correctional classification and risk assessment.

The PAI is a self-administered objective measure of personality and psychopathology that was designed to provide information across critical client variables (Morey, 2003). The PAI consists of 22 non-overlapping scales that provide “information relative to clinical diagnoses, treatment planning, and screening for psychopathology” (Morey, 1991, p. 5). Four validity scales were included to identify careless or idiosyncratic responding and intentional profile distortion (Morey, 2003). Eleven clinical scales were derived to correspond to major categories of diagnostic nosology (i.e., *DSM-IV*) and include conceptually derived subscales that increase the breadth of coverage of clinical constructs (Morey, 1996). Five treatment scales were designed to assess relevant treatment and case management variables, and two interpersonal scales measure personal relationship variables (Morey, 2003; see Appendix A for a description of PAI scales and subscales). Finally, critical item analyses were included to provide cues to important clinical information in addition to performance relevant to community/clinical norms (Morey, 1991).

PAI scale scores are standardized using linear *T* scores with a mean of 50 and a standard deviation of 10. Although scale *T* scores are relative to a representative sample of adults living in the community, comparison norms are available for multiple groups (e.g., psychiatric populations, prisoners, and college students; Morey, 1991). Higher scale scores are reflective of increased endorsement of traits consistent with a particular construct (e.g., mania). Because the PAI was developed and normed with adults, it is not recommended for use with individuals younger than age 18. A Spanish translation of the PAI was made available soon after the English version; however, the publishers of the Spanish version of the PAI have been criticized for publishing the test before validation studies could be undertaken (Fantoni-Salvador & Rogers, 1997; Rogers, Flores, Ustad, & Sewell, 1995).

PAI Development

Prompted by a lack of alternative objective personality instruments "that adhered to the tenets of the construct validation framework while providing measures of clinically important constructs" (Morey, 1991, p. 1), the PAI was created to provide a broadband measure of psychopathology that would aid clinicians and researchers in the diagnosis of mental disorders (Morey, 1991). To ensure inclusion of a wide range of phenomena consistent with a variety of clinical syndromes, the development of the PAI began with the identification of psychiatric disorders that would be assessed on clinical scales. Each disorder was selected on the basis of its significance in diagnostic practice and consistency of importance in diagnostic nosology (Morey, 1991; 2003). Following scale selection, items were developed that sampled the type and severity of symptomatology associated with each clinical construct (Morey, 1991). The initial item pool consisted of 2,200 items that were evaluated via rating tasks, panel reviews, expert sorts, and empirical methods, which culminated in the final 344 item measure.

Morey (2003) described the PAI development process as follows. In order to provide multiple reference groups to which an individual could be compared, the PAI was normed on three large representative samples. Community norms were based on a sample of 1,000 adults who were stratified for age, gender, and race using 1995 projected U.S. census rates. The community norms were made up of individuals from 12 states and included representative proportions of individuals from rural and urban environments. Clinical norms were established from 1,265 mental health patients from 65 mental health agencies across the United States. Finally, college norms were established from 1,051 college students across seven U.S. higher education institutions. In addition, Morey (1991) provided *T* score conversion tables based on 219 individuals over the age of 60 and 117 census matched Black community members. Although these latter two norm groups provided useful reference groups, the small numbers in each group have prompted Morey (1991) to recommend against their use in most clinical and research situations.

In addition to creating a measure that would be compatible with empirical findings and current diagnostic practice, Morey (1991) sought to improve upon the practical and methodological limitations of other objective personality measures. Arguing that the use of empirical keying as the primary method of item selection adversely affected the ability of many earlier tests to discriminate between psychiatric disorders (i.e., items were selected on the basis of their ability to discriminate between members of a criterion group and a normal population), Morey employed an item/scale development method that placed heavy emphasis on construct validation in order to maximize the discriminant validity among PAI scales.[2] Multiple item selection procedures were undertaken to avoid overreliance on any single method and to ensure adequate content validity (Morey, 1991; 2003).

To further increase discriminant validity and to minimize interpretation difficulties, PAI scales were designed to contain no overlapping items (i.e., items that are scored on more than one scale). Because overlapping items increase the congruence between scales, the ability of scales that share items to discriminate between presumably distinct constructs is compromised (Morey, 1991). The use of four-point Likert-type items (with anchors of *totally false*, *slightly true*, *mainly true*, and *very true*) improved on the dichotomous format (e.g., *true*/*false*) of many other inventories by capturing qualitative information related to the severity of the phenomena under investigation, rather than the presence or absence of a symptom or characteristic (Morey, 2003).

As previously discussed, the reading level necessary to understand and complete a measure significantly impacts its utility across populations. Designed with this in mind, the PAI's fourth-grade literacy level was a notable improvement over measures such as the MMPI-2, which requires an eighth-grade reading level to complete. Literacy level is particularly relevant in forensic and correctional settings because overall reading ability is lower in that population than in community populations (Muirhead & Rhodes, 1998). Likewise, because the PAI has fewer items than other prominent multiscale tests, it

[2] Because empirically keyed items/scales are included solely on their ability to discriminate between two groups, the ability of these items/scales to discriminate between other groups is questionable (Morey, 1991). For example, if item/scale X is created on the basis of its ability to reliably differentiate between individuals with schizophrenia and non-mentally ill individuals in the community, its use for discriminating individuals with schizophrenia from individuals experiencing a manic episode should not be assumed.

requires less time to administer and is less susceptible to respondent fatigue (Morey, 2003).

Acknowledging cultural bias to be a problematic aspect of many psychological tests, Morey (1991) instituted a two-step procedure to minimize cultural bias in the PAI. First, a bias panel that was made up of men and women from a variety of cultural backgrounds was convened in the latter stages of item development. The purpose of this panel was to review all potential test items for cultural bias and to identify items that were reflective of factors other than emotional or behavioral problems (e.g., socioeconomic background; Morey, 2003). A second step consisted of undertaking a psychometric evaluation of each item as a function of demographics. According to Morey (2003), “the intent of this approach was to eliminate items that had different meanings for different demographic groups” (pp. 5-6). However, the purpose of this strategy was not to eliminate mean demographic differences (e.g., antisocial personality traits may be more prevalent among men than women); rather, it was intended to eliminate items that reflected a phenomenon for one demographic group but did not reflect the same phenomenon for another group (Morey, 2003).

Despite the steps taken to improve upon the problems and limitations of earlier multiscale personality inventories, the PAI is not without limitations. Because it was designed to be a measure of psychopathology consistent with accepted diagnostic conceptualizations, and assuming that disorders are categorical rather than dimensional, it has limited usefulness in assessing normal personality traits (Morey, 1991; 2003). Similarly, because the content coverage was limited to syndromes more common to general clinical practice, many disorders included in the *DMV-IV* are not addressed on the

PAI (e.g., eating disorders; Morey, 2003). The lack of normative data for non-U.S. populations limits generalizability outside of the United States (Boyle, 1995). Likewise, although much of the psychopathology covered by PAI items exists among child and adolescent populations, neither child/adolescent norms nor a child/adolescent version have been produced to date, thus limiting its use to those 18 and over.

Psychometric Properties

Investigations into the psychometric properties of the PAI have generally demonstrated strong reliability across scales (Boone, 1998; Helms, 1993; Morey, 1991). Although reliability estimates tended to vary somewhat across scales and populations, Morey (1991) reported strong median internal consistency, temporal stability, and configural stability values across PAI full scales across the PAI validation samples. Two notable exceptions were the Inconsistency (ICN) and Infrequency (INF) validity scales, which tended to have lower test-retest and internal consistency values than other scales (Kavan, 1995). In an examination of an inpatient psychiatric population, Boone (1998) found large internal consistency estimates across scales that corresponded with estimates with the PAI clinical standardization group. Similarly, Boyle and Lennon (1994) demonstrated moderated temporal stability and high internal consistency across scales among community and psychiatric Australian samples.

Morey (1991) employed multiple PAI exploratory factor analyses, resulting in a four-factor solution across all scales: (a) subjective distress/affective disruption, (b) behavioral acting-out associated with impulsivity and poor judgment, (c) egocentricity/exploitativeness, and (d) carelessness in responding (clinical populations) or sensitivity in social relationships (normal populations). As can be seen, the interpretation of the fourth factor varied depending on the population under investigation. Despite using a different factor extraction and rotation method, Deisinger (1995) found a similar four-factor solution among a large sample of community volunteers that corresponded closely to the validation factor structure. Boyle and Lennon (1994) were unable to replicate Morey's four-factor solution with a sample of Australian participants. These authors criticized Morey for employing a "short-cut" (p. 182) factor analytic procedure, which they contended to have resulted in a poor factor solution. However, Conger and Conger (1996) responded that because of large differences between samples and different factor analytic procedures it should not have been surprising that Boyle and Lennon's sample produced different results than were reported by Morey, and they indicated that Boyle and Lennon's results did not demonstrate that either solution was defective (see Boyle 1996, Morey, 1995, and Conger & Conger, 1996, for detailed discussion regarding Morey's factor analytic methodology).

Several investigators have explored the validity of various PAI scales in the assessment of individuals across a variety of settings. The validity scales have been among the most frequently researched PAI scales. Finding results generally supportive of the scales' utility in clinical environments, researchers have demonstrated adequate utility of the validity scales to identify simulated feigning/malingering (Bagby, Nicholson, Bacchiochi, Ryder, & Bury, 2002; Blanchard, McGrath, Pogge, & Khadivi, 2003; Morey & Lanier, 1998; Rogers, Sewell, Morey, & Ustad, 1996) and individuals attempting to provide an overly favorable impression (Morey & Lanier, 1998; Peebles & Moore, 1998). The Negative Impression scale (NIM) has been found to discriminate between malingering individuals and genuine psychiatric patients (Rogers, Sewell, Cruise, Wang,

& Ustad, 1998) and has displayed strong convergent validity with other measures of feigned response style (Rogers, Ustad, & Salekin, 1998). However, individual PAI scales may not perform as well in the detection of sophisticated malingering (Rogers et al., 1996).

In a comparison of the utility and practicality of the PAI and MMPI-2 validity indices in an inpatient psychiatric facility, LePage, Mogge, and Sharpe (2001) matched participants according to age, gender, the amount of time hospitalized, and diagnostic category. The authors found evidence that the number of items necessary to complete each inventory impacted its validity rate. Because the majority of invalid MMPI-2 profiles were associated with the latter half of the test, it was hypothesized that respondent fatigue or resistance contributed to invalid response styles. Consistent with this hypothesis, the PAI had a significantly lower rate of invalid profiles than the MMPI-2. It was further argued that because MMPI-2 validity and clinical scales have significant item overlap the endorsement of serious psychiatric disturbance associated with this impatient population may have inadvertently increased scores on those scales designed to detect invalid responding. Thus, the non-overlapping content of the PAI may provide an advantage in use with inpatient populations as compared to the MMPI-2.

The detection of random responding with the PAI has been less researched than has the identification of intentional response distortion. Morey (1991) demonstrated the Infrequency (INF) and Inconsistency (ICN) scales could reliably be used to identify random response styles. After 1,000 computer-generated random response PAI profiles were combined with profiles generated by the community and psychiatric validation samples, use of the ICN and INF scales led to correct classification of 99.4% of the random profiles. More recent research undertaken by Clark, Gironda, and Young (2003) raised questions regarding the usefulness of the PAI in identification of *back random responding* (BRR; i.e., responding to early portions of a test in a valid manner followed by random responses for latter items). Although ICN and INF were found to be effective for detecting random responding that occurred throughout the instrument, they did not perform well in the identification of BRR. Acknowledging the negative impact of BRR on any measure, Morey and Hopwood (2004) identified a potential PAI BRR detection strategy using the Alcohol Problems (ALC) and Suicidal Ideation (SUI) scales. However cross validation efforts are necessary before clinical use for the detection of BRR could be recommended.

Morey (1991) examined the associations of individual PAI scales with more than 50 established measures of psychopathology. Strongly supportive of the overall construct validity of the PAI, all validity, clinical, treatment, and interpersonal scales displayed strong convergent associations with instruments that measured similar constructs (e.g., Depression [DEP] was strongly correlated with the Beck Depression Inventory [BDI; Beck & Steer, 1987]). Likewise, strong divergent associations were found between theoretically opposed constructs (e.g., Non Support [NON] was negatively correlated with perceived social support). Diagnostic and clinical judgment investigation were also undertaken to ascertain that PAI scales converged in an expected direction with empirically established relationships.

Although several researchers have investigated the utility of PAI clinical, treatment, and interpersonal scales since its publication, given the number of constructs assessed by the PAI a tremendous amount of research remains necessary to determine individual scale utility with nonforensic/noncorrectional populations. Nonetheless, empirical investigations have been generally supportive of the utility of the PAI in assessing psychopathology. For example, Borderline Features (BOR) scale elevations have been found to reliably differentiate between individuals diagnosed with borderline personality disorder and a sample of college students (Bell-Pringle, Pate, & Brown, 1997) and have been associated with increased levels of affective disturbance and poor coping skills (Trull, 1995). Likewise, Drug Problems (DRG) scale elevations have been associated with increased substance use and negative consequences associated with substance abuse (Kellog et al., 2002), and the ALC and DRG scales have demonstrated adequate convergent validity with other measures of addiction among individuals in an inpatient chemical dependency treatment center (Parker, Daleiden, & Simpson, 1999). Regarding use with inpatient psychiatric populations, the Schizophrenia scale (SCZ) has demonstrated utility in differentiation between individuals with schizophrenia-spectrum diagnoses and individuals with other psychiatric diagnoses (Klonsky, 2004).

Forensic/Correctional Applications of the PAI

Although not originally designed for use in forensic/correctional settings, several aspects of the PAI render it appealing for the assessment of offenders (Douglas, Hart, & Kropp, 2001; Edens, Cruise, et al., 2001; Rogers, 2003). In particular, several of the clinical variables assessed by the PAI, such as aggression, anger, and antisocial features, are salient domains in forensic/correctional contexts (Douglas et al., 2001; Edens, Cruise, et al., 2001). The PAI clinical profile provides important information that can aid decision makers in offender classification, treatment planning, and risk assessment (Morey & Quigley, 2002). In addition to the general psychometric superiority of the PAI when compared to other multiscale inventories (Morey, 1996; Rogers, 2003), researchers have argued that, because the PAI has fewer total items and requires a lower level of reading comprehension to complete, it has practical advantage in forensic/correctional settings (Douglas et al., 2001; Edens, Cruise, et al., 2001; Morey & Quigley, 2002; Rogers, 2003).

The growing popularity of the PAI in forensic/correctional contexts has resulted in increased attention on the part of researchers regarding its utility with offender populations. Duellman and Bowers (2004) undertook a quantitative analysis of the available research that examined the PAI in forensic and correctional settings. Finding a moderate effect size across studies, the PAI was described as promising for use with forensic/correctional populations, particularly in regard to classification and treatment decisions. Likewise, the PAI demonstrated adequate concurrent validity with other measures frequently employed for forensic purposes. However, the authors acknowledged this research to be limited by relatively few (i.e., 18) studies, most of which had taken place in Texas.

Rogers (1997) noted that involuntary settings and evaluations, which are typical of forensic/correctional environments, increase the likelihood of dissimulation. Although the results of studies with a variety of populations have consistently suggested high utility across the PAI validity scales in the classification of feigning (Edens, Cruise, et al., 2001; Rogers, 2003), because the majority of studies utilized simulated feigners some have questioned the generalizability of findings to forensic populations (Rogers, Sewell, et al., 1998). The few direct examinations of the PAI malingering scales within forensic/correctional settings have resulted in robust support for NIM and the

Malingering Index (MAL) in identifying individuals known to be malingering (Rogers, Sewell, et al., 1998) and robust correlations with other measures of feigning/malingering (Rogers, Ustad, et al., 1998; Wang et al., 1997). However, although apparently strong in simulation studies, research with the Rogers Discriminant Function (RDF) scale has been mixed in forensic contexts (Edens, Cruise, et al., 2001; Rogers, Sewell et al., 1998; Rogers, Ustad, et al., 1998).

Few researchers have specifically addressed the utility of the PAI clinical and treatment scales for forensic and correctional populations. In an examination of the convergent validity of the PAI in a correctional facility, Rogers, Ustad, et al. (1998) found high correlations between Depression (DEP), Paranoia (PAR), Anxiety (ANX), and the Suicide Potential Index (SPI) with other measures of similar constructs. Of particular interest, the Schizophrenia scale (SCZ) displayed moderate correlations with many measures of symptoms and diagnoses other than psychosis, including other PAI scales. Based on these findings, Rogers and his colleagues contended that SCZ may be a measure of general impairment and distress, rather than a unitary psychotic spectrum construct. This hypothesis holds promise in regard to assessing and predicting institutional adjustment among newly incarcerated offenders. Likewise, Wang et al. (1997) found several PAI clinical scales and subscales to be correlated with the number of emergency suicide assessments performed by mental health staff in a forensic psychiatric hospital. The highest correlations with emergency assessments were the SUI and BOR scales and the Depression-Cognitive (DEP-C) subscale.

An important construct that must be considered when assessing forensic populations is psychopathy, which has been found to be associated with antisocial behaviors such as violence and criminal recidivism (Quinsey et al, 1998). Contrary to the dearth of research examining most PAI clinical scales in forensic settings, a growing body of research has demonstrated the ability of the PAI to measure psychopathy and antisocial personality traits (Buffington-Vollum et al., 2002; Edens et al., 2000; Salekin, Rogers, Ustad, & Sewell, 1998; Walters, Duncan, & Geyer, 2003). The Antisocial Features scale (ANT) was designed specifically to assess both trait personality and behavioral features associated with psychopathy (Morey, 2003) and is comprised of three subscales intended to measure unique aspects of psychopathic symptomatology (Edens, Cruise, et al., 2001): Antisocial Behaviors (ANT-A), Stimulus-Seeking (ANT-S), and Egocentricity (ANT-E).

As is true for the PAI clinical scales, few researchers have examined ANT subscales. Among forensic psychiatric patients and incarcerated sex offenders, Edens et al. (2000) found moderately strong correlations between ANT and other measures of antisocial traits including the PCL-R. After controlling for unique variance, they found that neither ANT nor its subscales were related to the affective or interpersonal traits associated with psychopathy (Factor 1), with most variance accounting for behavioral aspects of psychopathy (Factor 2). However, in an examination of factors associated with recidivism among female offenders, Salekin et al. (1998) found ANT-E to be associated with Factor 1 symptomatology and to be among the best predictors of future recidivism among measures of psychopathy. This discrepancy may be indicative of gender differences in the construct of psychopathy as measured by the PAI; however, given that Salekin et al.’s study represents the only such examination of female offenders to date, additional research is necessary.

More recently, researchers have examined the utility of the PAI in the prediction of aggression, institutional adjustment, and recidivism among mentally ill offenders (Edens et al., 2000; Walters et al., 2003; Wang & Diamond, 1999) and incarcerated sex offenders (Buffington-Vollum, 2002; Caperton et al., 2004). Given the association of antisocial traits as measured by the PCL-R with institutional violence and recidivism among mentally disordered offenders (Heilbrun et al., 1998), it is not surprising that researchers have found ANT scores to be associated with subsequent institutional misconduct (Buffington-Vollum et al., 2003; Caperton et al., 2004; Walters et al., 2003). However, when institutional misconduct is classified according to infraction type, the research regarding the validity of ANT as a predictor of physical violence is mixed. Although Buffington-Vollum et al. (2003) found ANT scores to be associated with nonaggressive and verbally aggressive acts among incarcerated sex offenders, ANT scores were not significantly related to physically aggressive acts. However, in an examination of the link between various factors and institutional violence among hospitalized mentally ill offenders, Wang and Diamond (1999) found an antisocial personality style, as measured by ANT subscales, to be highly associated with both physical and verbal aggression. These findings remained robust after controlling for demographic factors.

By combining data from three aforementioned studies (Buffington-Vollum et al., 2002; Caperton et al., 2004; Edens, Pothress, et al., 2001) with two additional samples of incarcerated offenders, Edens and Ruiz (2005) created a sample of 713 inmates with which to examine the utility of ANT in the prediction of institutional misconduct. These authors found a significant positive relationship between ANT scores and adjudication for general misconduct (r = .21), aggressive misconduct (physical or verbal aggress/acts of defiance; r = .27), and physically violent infractions (r = .15). When broken down according to gender, only slight differences between male and female inmates were noted in the strength of associations between ANT and institutional misconduct, which followed a pattern similar to the combined sample. A linear relationship between ANT scores and base rates of misconduct were demonstrated, with higher scores being associated with a higher base rate of misconduct across infraction categories.

Edens and Ruiz (2006) undertook a prospective investigation into the ability of ANT and PIM to identify individuals at risk for correctional institution misconduct. Employing a prospective design, the authors found both scales to be predictive of general misconduct, physically violent acts, and aggressive-defiant infractions. Upon examination of cut scores, they found that individuals with ANT *T* scores greater than 60 were 5.5 times more likely to commit any type of infraction and were 7.5 times more likely to commit a violent infraction. Similarly, individuals whose PIM *T* score was greater than 57 were 6.6 times more likely to commit a violent infraction. However, although the obtained odds ratios were impressive and the implementation of this strategy would likely capture a high proportion of those who eventually evidence problematic institutional behaviors, given the relatively low cut scores employed (i.e., ≤ 1 *SD*), a high false positive rate would also be likely. Of note, a significant interaction was found between ANT and PIM in the prediction of verbally aggressive-defiant infractions.

Another scale that was designed to assess factors associated with violence and aggression is the Aggression scale (AGG). More specifically, AGG was constructed to assess attitudes and behaviors associated with aggression, hostility, and anger (Morey, 2003). AGG is made up of three subscales: Aggressive Attitude (AGG-A), Verbal Aggression (AGG-V), and Physical Aggression (AGG-P). Researchers have demonstrated AGG associations with general institutional misconduct among male sex offenders (Capterton et al., 2004) and recidivism among female offenders (Salekin et al., 1998). In an examination of various factors associated with institutional violence, Wang and Diamond (1999) found strong links between anger, as measured by AGG-A, and verbal and physical aggression among hospitalized offenders.

In addition to the aforementioned scales that were specifically derived to assess aggressive and antisocial personality traits, many PAI scales that were constructed to measure a variety of other forms of psychopathology may also be associated with antisocial behaviors and violence risk. One such scale is the BOR scale, which is composed of subscales designed to assess personality traits associated with borderline personality disorder. In their examination of the usefulness of the PAI in assessing problematic behaviors in a forensic psychiatric hospital, Wang et al. (1997) found a relatively weak but significant correlation between BOR and aggression as measured by the Overt Aggression Scale (OAS; Yudofsky, Silver, Endicott, & Williams, 1986). When BOR was examined according to subscales, the Affective Instability (BOR-A) and Self-Harm (BOR-S) subscales performed better than the overall BOR score. In fact, BOR-S exhibited the highest correlation with OAS total score of all the examined PAI clinical scales or subscales, including those designed to assess aggressive traits (i.e., AGG & ANT).

Morey (1996) utilized existing research regarding the prediction of dangerousness to identify 20 features assessed by the PAI to create a risk constellation index termed the

Violence Potential Index (VPI). Factors that make up the VPI include explosive anger, rapid mood swings, hostile suspiciousness, and impulsivity (see Table 1). Each endorsed factor contributes equally to a total score, with higher scores indicating a higher potential for future violence (Morey, 1996; 2003). Although Morey (1996) reported preliminary VPI convergent associations with other scales that measured similar constructs (e.g., BOR, ANT, AGG, and Wiggins MMPI Hostility Scale), only two subsequent empirical examinations have been undertaken to date investigating the relationship between VPI scores and violent behavior.

Caperton et al. (2004) found AGG, ANT, and VPI to be significant predictors of the occurrence of disciplinary infractions among incarcerated sex offenders. However, after controlling for the influence of ANT scores, both AGG and VPI scores were no longer significant, leading the authors to question the utility of considering VPI and AGG scores beyond information obtained by ANT. Similarly, Edens and Ruiz (2005) ran a series of partial correlations with their combined sample of incarcerated offenders to examine whether theoretically relevant PAI scales (i.e., AGG, BOR, VPI, DOM, and MAN) would demonstrate significant correlations with institutional misconduct after controlling for the variance associated with ANT. Across the five scales and three infraction categories, only two modest effects remained after controlling for ANT: DOM and MAN displayed significant associations with aggressive infractions.

In sum, researchers have shown several PAI scales to be associated with institutional violence and disruptive behaviors. In particular, the ANT scale has been the most widely researched and has displayed the strongest relationship with problematic institutional behaviors. Based on the empirically supported factors related to violence in

Table 1

Violence Potential Index

Violence Risk Factor	PAI Marker
1. Explosive expression of anger	AGG-P 15*T* higher than AGG-V
2. Anger directed outward	AGG 10*T* higher than SUI
3. Hostile control in relationships	DOM 10*T* higher than WRM
4. History of trauma without fearfulness	ARD-T 15*T* higher than ARD-P
5. History of antisocial behavior	ANT-A > 70*T*
6. Limited capacity for empathy	ANT-E > 60*T*
7. Sensation seeking	ANT-S > 60*T*
8. Rapid mood changes	BOR-A > 70*T*
9. Troubled close relationships	BOR-N > 70*T*
10. Impulsivity	BOR-S > 70*T*
11. Agitation	MAN-A > 60*T*
12. Self-centered	MAN-G > 70*T*
13. Negative world view	NIM > 70*T*
14. Hostile suspiciousness	PAR-H >70*T*
15. Sense of persecution	PAR-P > 70*T*
16. Psychotic symptoms	SCZ-P > 70*T*
17. Social Alienation	SCZ-S > 70*T*
18. Alcohol as disinhibitor	ALC > 70*T*
19. Drug abuse as disinhibitor	DRG > 70*T*
20. Estrangement from support system	NON > 70*T*

Note. From Morey (1996, p. 218).

correctional environments that were identified in previous sections, additional PAI validity, clinical, treatment, and personality style scales and subscales may also be useful in the assessment of violence potential. For example, scales that are intended to assess the presence of a negative world view (NIM), mania (MAN), paranoia (PAR), psychotic spectrum symptomatology (SCZ), and interpersonal dominance (DOM) may add incremental validity to the prediction of institutional violence. However, to date, little to no research has been undertaken examining these scales in relation to violence and aggression or institutional misconduct.

Noting the growing use of the PAI in correctional settings, Edens and Ruiz (2005) recently undertook the creation of a computer-generated interpretive report for use in correctional environments (referred to as the PAI Interpretive Report for Correctional Settings, or PAI-CS). These researchers sought to create a report that, in addition to providing clinical information available in the traditional PAI report, would (a) identify risk for institutional misconduct, (b) describe the psychosocial needs, and (c) predict response to institutional and rehabilitative programming. To assist correctional clinicians in comparing inmate scale elevations to other correctional populations, a correctional normative sample was created that was composed of 1,155 incarcerated offenders in multiple sites across four U.S. regions. In addition, four new scales were created on an experimental basis to assess the location of random responding (Infrequency-Front [INF-F]; and Infrequency-Back [INF-B]), rare response styles for correctional populations (Inconsistency-Corrections Index [ICN-C]), and personality characteristics associated with addictive behaviors (Addictive Characteristics Scale [ACS]). Although potentially useful for the assessment of incarcerated offenders, future research regarding the practical utility and validity of the PAI-CS is needed.

Given its multifaceted nature, research supporting its use with a variety of populations and symptomatology, ease of administration and interpretation, and low literacy rate, the PAI has the potential to be a useful tool in assessing general adult offenders across a plethora of variables. One such construct that is particularly important in correctional classification is the potential for violent acts and other disruptive behaviors. A small, but steadily growing body of literature provides initial support for the PAI in assessing potential for violence, aggression, and institutional misconduct. However, questions regarding generalizability of the reviewed research are raised due methodological shortcomings, such as small sample sizes and retrospective research designs. Likewise, many theoretically sound scales and subscales have yet to be examined and, for those scales that have been scrutinized, few studies are available and in some cases the evidence is mixed. Moreover, much of the available research provides convergent validity of the PAI with other measures of aggression rather than demonstrating its relationship to true institutional infractions. Finally, given that all of the identified research either examined incarcerated sex offenders or psychiatrically hospitalized mentally ill offenders, the generalizability of findings to a general population of incarcerated offenders has yet to be demonstrated. Thus, although the identified research regarding the usefulness of the PAI in assessing and predicting institutional violence is promising, further research addressing the aforementioned limitations is necessary.

Methodological Issues Inherent in Violence Risk Assessment

In the preceding sections I reviewed relevant research regarding empirically identified correlates to antisocial and violent behaviors. Although a majority of researchers to date have focused on community violence (Wang & Diamond, 1999), research that has been undertaken with correctional populations has provided tremendous insights into risk and protective factors associated with correctional maladjustment. Many risk factors have been incorporated into tools designed to aid clinicians in classification of risk for institutional misconduct. However, clinicians and policy makers must be aware of certain methodological issues that are inherent in the prediction of violent and disruptive behaviors and that may limit strong generalizations of many empirical findings into clinical practice. Though a comprehensive review of the methodological shortcomings inherent to the prediction of future violent or antisocial behaviors is beyond the scope of this paper (see Loza, 2003), a few noteworthy issues warrant further discussion.

The Effect of Base Rates on Prediction

Failure to consider the statistical base rate of occurrence in the population under investigation is the most common and problematic error made by clinicians when assessing risk for violent and antisocial behavior (Monahan, 1981). Base rate refers to how frequently an event or behavior occurs. Accordingly, a low base rate behavior is one that occurs rarely and is therefore difficult to predict (Loza, 2003). Contrary to conventional opinion, official records of institutional misconduct, particularly institutional violence, have consistently been found to be low base rate events. Research into the behaviors of a variety of incarcerated populations has demonstrated the base rate of violent infractions to range from 7 to 20% (Baskin et al., 1991; Cunningham et al., 2005; Cunningham & Reidy, 2002; Edens, Poythress, et al., 2001; Edens & Ruiz, 2006). That is, the percentage of incarcerated offenders who are adjudicated for a violent infraction while incarcerated has been demonstrated to be less than 1 in 5 in many cases. Unsurprisingly, the length of investigation appears to be positively related to the base rate of institutional violence, such that the longer inmate violence is tracked for study, the higher the base rate. For example, the highest base rate of institutional violence among reviewed studies was demonstrated by Cunningham et al. (2006) who retrospectively tracked the institutional behaviors of a sample of maximum security inmates for 11 years.

Two statistical problems hinder the ability of clinicians to forecast low base rate events, the first of which concerns the impact of rare criterion variables on the magnitude of relationships. In order to examine the relationship between one or more correlates and a rare event, researchers often must utilize dichotomous criterion variables (e.g., presence vs. absence of violent behaviors during incarceration). For example, in the identification of the relationship between PICTS composite scales and aggressive disciplinary infractions, Walters and Geyer (2005) found that 18% of inmates committed an aggressive infraction; however, only 4% committed more than one aggressive infraction during the study period. Thus, they employed a dichotomous outcome (i.e., committed an aggressive infraction vs. did not commit an aggressive infraction) because the use of a continuous outcome variable (i.e., the rate of aggressive infractions) would have been of little practical use given that the vast majority of subjects did not have multiple adjudications.

The use of dichotomous outcome variables results in a statistical phenomenon in which an artificial ceiling is placed on the absolute magnitude of correlation between variables that varies according to the base rate of the dependent variable (Nunnally & Berstein, 1994). As the base rate of occurrence decreases, the strength of relationship between predictor and criterion decreases, resulting in an underestimation of the actual relationship between variables. For example, Nunnally and Berstein (1994) demonstrated that the strongest correlation that could be obtained for an outcome with base rate of 10% would be .58. Thus, attempting to make an absolute judgment results in errors that reduce the ability of a method to make accurate predictions (Kroner, 2005).

The second problem that occurs when attempting to predict a low base rate event is associated with a decrease in predictive accuracy (Monahan, 1981; Proctor, 1994; Van Voorhis & Brown, 1996). As summarized by Loza (2003), one of four occurrences results when predicting violent/antisocial behavior. A true positive prediction is a prediction of violent/antisocial behavior that later materializes. A true negative prediction refers to an accurate prediction that violent/antisocial behavior will not occur. Inaccurate predictions include false positive predictions, or predictions of violent/ antisocial behaviors that do not materialize, and false negative predictions, or incorrect predictions that an individual will not exhibit violent/antisocial behaviors.

The goal of any prediction scheme is to maximize true predictions while minimizing false predictions (Loza, 2003); however, as the base rate diverges from 50%, the ability of a prediction scheme to accurately predict behaviors decreases. A population that demonstrated a base rate of 50% is considered optimal for prediction because it allows for the greatest opportunity to accurately predict violent/antisocial behaviors beyond predictions based on base rate alone (i.e., 50% chance of accurate prediction). For example, when the base rate of violent behaviors is 10%, the ability of a highly accurate prediction scheme is unlikely to improve accuracy beyond that which would be obtained by simply predicting everyone will not become violent (i.e., error rate would equal 10%; Monahan, 1981).

Although clinicians must be cognizant of all types of erroneous predictions, false positive predictions are much more likely occurrences than are false negative predictions because violent/antisocial behaviors are low base rate events. As a base rate diverges from 50%, the rate of false positive predictions increases substantially (Monahan, 1981; Schaffer et al., 1994). That is, “even when clinicians follow good predictive procedures, they will end up making many more false positives than true positive predictions” (Loza, 2003, p. 177). False positive predictions can be particularly detrimental in criminal justice settings because an incorrect prediction of violent/antisocial behaviors can erroneously result in loss of liberties (Loza, 2003; Monahan, 1981).

The problems associated with base rate have contributed to doubts regarding the utility of traditional statistical approaches (e.g., correlational methods) to evaluate event prediction schemes for low base rate events, including institutional misconduct and violence, and have resulted in increased attention being paid to evaluation methods that are less dependent on base rate. One such method that has grown in popularity for the evaluation of violence prediction schemes is the analysis of receiver operating characteristics (ROC).

Receiver Operating Characteristics

ROC analysis is an estimate of the true accuracy of a test and is unaffected by base rate (Mossman, 1994; Quinsey et al., 1998). It is represented graphically by calculating and plotting the specificity and sensitivity rates (in practice, 1 - sensitivity) associated with all possible cutoff scores (i.e., operating points) associated with a given test on a dichotomous outcome (Edens et al., 2000; Gallop, Crits-Christoph, Muenz, & Tu, 2003). Specificity is defined as the ability of a particular cutoff score to correctly identify individuals who display the behavior under investigation (e.g., institutional violence), and sensitivity refers to the ability of a cutoff score to correctly identify individuals who will not display the behavior. Specificity and sensitivity estimates range from 0 to 1 and represent the rate of true positive and true negative predictions (Gallop et al., 2003). Connecting all points of the plot results in a curve that represents the overall accuracy of the prediction method (see Figure 1).

The statistical index associated with ROC analysis is the proportion of the graph that is below the plotted curve, known as the area under the curve (AUC). Ranging from 0 to 1, AUC is an estimate of the predictive accuracy of a given test (Mossman, 1994; Quinsey, et al., 1998). An AUC of .5 is equivalent to chance prediction (Douglas & Webster, 1999) and is the null hypothesis associated with ROC analysis. AUCs above .5 are considered indicative of positive prediction and AUCs below .5 are found among negative predictors. Large AUC effect sizes for positive predictors are those above .714, and medium and small effect size thresholds are .556 and .639 respectively (Rice & Harris, 2005). In addition to AUC, the shape of the curve can be useful in the identification of an optimal cutoff score (Edens et al., 2000; Gallop et al., 2003).

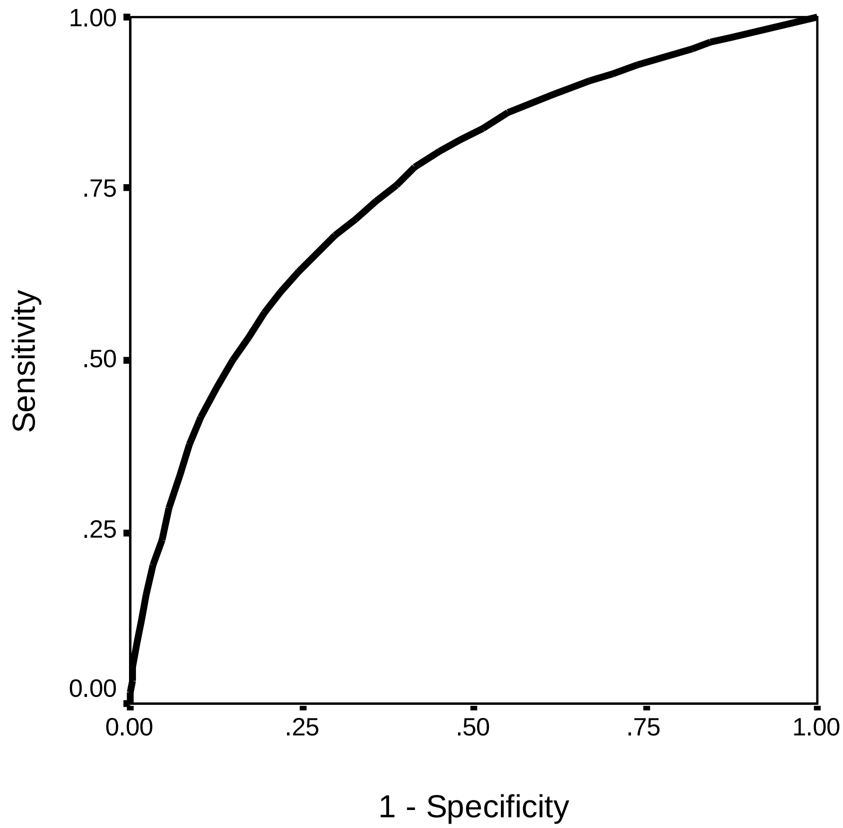


Figure 1. Sample ROC curve.

Originally developed for electronic signal detection more than 40 years ago, ROC analysis has been applied across many fields and disciplines (Gallop et al., 2003). ROC analyses have recently gained popularity in the evaluation of violence prediction schemes because they provide estimates of accuracy that are less affected by base rates than more traditional inferential analyses (Douglas & Webster, 1999; Kroner, 2005; Mossman, 1994, Quinsey et al., 1998). Because ROC analyses are also unaffected by test selection ratios, they permit direct comparison of the accuracy of predictive schemes across different base rates and selection ratios (Quinsey et al., 1998). A third strength of ROC analyses in the evaluation of prediction schemes is their immunity to clinician biases for or against Type I or Type II prediction errors (Mossman, 1994). Because the AUC represents the collective strength of all potential cutoff scores, it is unaffected by the tradeoff between false positive and false negative rates associated with specific cutoff points. Finally, ROC analyses allow for calculation of an optimal cutoff score for a given base rate based upon unique sensitivity and specificity needs (Gallop et al., 2003; Quinsey et al. 1998).

Impoverished Variables

Another issue of concern in predicting institutional violence was articulately stated by Monahan (1981): “One cannot even hope to predict what has not been defined” (p. 32). The institutional risk assessment literature is plagued by studies with ill-defined outcome variables (Wang & Diamond, 1999). Due in part to the previously noted problems associated with low base rates of violence and other serious types of disruptive behaviors, many researchers have adopted a strategy in which less serious and more serious behaviors are aggregated into large nonspecific outcome variables (Guy et al., 2005). Because overly inclusive outcome variables result in an increased base rate of offense, the accuracy of a prediction scheme is inflated when several types of problematic behaviors are operationalized as one variable (Cunningham & Reidy, 1998b; Guy et al., 2005; Monahan, 1981; Rogers, 2000). Although inmate risk of committing any problematic institutional behavior is important information from an institutional management perspective, the utility of such prediction schemes to forecast specific problematic behaviors that may be of more interest to correctional staff (e.g., violence) is limited (Guy et al., 2005).

Researchers have recently attempted to operationalize violent and disruptive behaviors into more specific outcome categories that would generalize across incarcerated populations. One exemplary method is a classification scheme developed by Edens et al. (1999), which has been employed by several researchers in the description and prediction of institutional misconduct among incarcerated offenders. Examining official records of institutional violations, Edens et al. classified institutional infractions into one of three categories: physically aggressive infractions (e.g., fighting, assault, etc.), verbally aggressive infractions/acts of defiance (e.g., written/spoken threats, disobeying an order, etc.), and nonaggressive infractions (e.g., theft, possession of contraband, etc.). Thus, in addition to allowing for evaluation of predictors of general misconduct, this classification scheme permitted investigation into predictors of specific behaviors of interest.

Extreme Groups

Yet another issue in prediction of institutional violence and misconduct was noted in a review of the literature regarding the use of structured personality inventories by

Carbonell et al. (1994). These authors noted a major shortcoming of many studies to be the comparison of groups that differed greatly in rates of institutional misconduct (e.g., model inmates vs. inmates in institutional segregation). Such comparisons have resulted in artificially inflated relationships between predictor and criterion variables (Megargee & Carbonell, 1985), which has limited the generalizability of findings to general population offenders. Rather than examining differences between groups that have divergent base rates of institutional misconduct, selecting samples that include representatives of the entire general population has been recommended. Although it would be likely to result in lower magnitude correlations when compared to extreme group comparisons, such a research strategy would provide data that were more relevant to actual clinical situations (Carbonell et al., 1994).

Reliance of Official Records of Misconduct

An additional issue of concern is that the manner in which violent and disruptive behaviors are measured has substantial implications for the evaluation of prediction schemes (Mulvey, Shaw, & Lidz, 1994). Researchers have overwhelmingly relied on official records of misconduct to estimate institutional misconduct. Many authors have argued that overreliance on official records has resulted in chronic underestimation of the true base rate of problematic behaviors exhibited in correctional institutions (Adams, 1986; Baskin et al., 1991; Gendreau et al., 1997; Mulvey et al., 1994). In addition to institutional management and safety issues associated with covert violent and antisocial behaviors, the statistical error associated with the underestimate of problematic institutional behaviors has likely resulted in suppressed statistical associations.

The usefulness of official records of institutional violations as the sole indicator of institutional misconduct is also dependent upon the consistency with which violations are assigned by correctional staff across inmates (Adams, 1986). However, several factors inherent to correctional systems, many of which were implemented to benefit inmates, leave little hope for consistency. Correctional officers are often afforded tremendous discretion when instituting formal charges of misconduct, particularly with regard to less serious violations (Gendreau et al., 1997). For example, verbal warnings or informal consequences are often applied in response to minor violations. Likewise, when dealing with mentally ill inmates a mental health referral may be given in lieu of formal charges (Adams, 1986; McShane, 1989). In fact, some evidence has suggested that correctional officers may employ a more lenient response threshold when approaching minor violations among mentally ill offenders (DiCataldo et al., 1995). Thus, official records of formal adjudications underestimate even those behaviors that do come to the attention of correctional officials.

The adjudicative process further contaminates the accuracy of official records as an estimate of problematic institutional behaviors. More specifically, institutional violations are often handled much like crimes in the criminal justice system: Inmates are charged with a violation, enter pleas at a formal hearing, and plead their case before an official responsible for rendering a verdict and assigning a disposition. As with the greater criminal justice system, cases are often plea bargained, resulting in guilty pleas for lesser charges. Although serious violations are much less likely to go undetected or unreported than are less serious violations (McShane, 1989; Menzies, Webster, McMain, Staley, & Scaglione, 1994), the institutional plea bargain process likely results in further underestimation of serious violations.

Despite general acceptance that reliance on official records underestimates the actual rate of offending, few researchers have compared official records of misconduct to other estimates of offending. In a comprehensive comparison of several methods of estimating violent behaviors among released psychiatric patients (i.e., self-report, collateral report, medical records, criminal records, and involuntary commitment records), Mulvey et al. (1994) found vastly different rates of violence across information sources. The base rate of violent behaviors ranged from 37% (self-report) to 1% (involuntary commitment records), with sole reliance on official arrest records resulting in an estimated violence base rate of 2%. The authors concluded that research strategies that include self-report methods in conjunction with official records were necessary to provide accurate empirical information to policy makers. Similarly, in a comparison of the concurrent validity of the PPI and PCL:SV with a sample of adult insanity aquittees, Kruh et al. (2005) found a higher base rate of violent crime when relying on self-report as compared to official arrest records.

One group of researchers examined self-report methods in conjunction with official records of misconduct in studies investigating the correlates of institutional violence among female inmates (Warren, Burnette, et al., 2002; Warren, Hurt, et al., 2002), demonstrating moderate correlations between self-reported violence and institutional records. However, no research was identified that has specifically compared the rates of violent and other problematic institutional behaviors obtained via self-report and official records. Thus, the degree to which official records of institutional misconduct and violence diverge from self-reported disruptive and violent behaviors among incarcerated populations remains unknown.

Cross-Validation and Shrinkage

The magnitude of regression coefficients shrink substantially upon cross-validation (Gagliardi, Lovell, Peterson, & Jemelka, 2004), which reduces the accuracy of prediction methods when applied to future samples and across differing contexts and populations (Cohen, 1990). However, many authors have argued that preoccupation with individual regression weights is misplaced and that what is most crucial for the development of a prediction method is whether or not an independent variable is truly associated with a criterion variable and the direction of association between variables (Cohen, 1990; Dawes, 1979; Dawes & Corrigan, 1974; Gagliardi et al., 2004). In fact, the use of simple unit weights (e.g., +1, 0, and -1) based on the direction of relationship between individual beta weights and a criterion variable are generally more practical and at least equally accurate as regression coefficients (Cohen, 1990). Indeed, violence prediction researchers have demonstrated simple risk score prediction schemes that are based upon the direction of regression weights to be equally effective as are prediction schemes composed of actual regression weights (Gagliardi et al., 2004). In addition to their resistance to the effects of regression weight shrinkage upon cross validation, the use of simple risk scores are considered advantageous in that they provide a much simpler method of calculating risk scores.

Paucity of Research Examining Protective Factors

The overwhelming majority of risk assessment methods and research place heavy emphasis on factors that increase risk while failing to consider risk-reducing factors (i.e., protective factors; Gagliardi et al., 2004; Rogers, 2000; Shaldrick, 1999). Rogers (2000) persuasively argued that accurate assessment of risk is contingent upon a balanced evaluation that includes both risk and protective factors. Accordingly, he likened current risk assessment practice and research with adults to that of financial planning based only on fiscal liabilities to the exclusion of monetary assets: “Predictions based on only one side of the ledger, be it financial or mental health, are markedly constrained in their usefulness” (Rogers, 2000, p. 598). Thus, the selective focus on risk factors leads to inherently inaccurate risk forecasts that overestimate the likelihood of criminal/violent behavior and can result in serious consequences for forensic populations (e.g., increased incarceration length; Gagliardi et al., 2004; Rogers, 2000).

Rogers (2000) defined protective factors as variables that reduce the likelihood of a maladaptive outcome (e.g., violent and antisocial behaviors). Questions have been raised as to whether protective factors should be operationalized as merely the absence of a risk factor or as independent risk-reducing constructs (Gaglardi et al., 2004; Rogers, 2000). Contributing to lack of consensus regarding the classification of protective vs. risk factors is the general lack of “well-formed, falsifiable theories of criminality or violence that generate truly causal hypotheses” (Gagliardi et al., 2000, p. 142) and that would provide persuasive theoretical grounds for variable classification. In absence of such theory, researchers have sought alternative methods for classifying risk and protective factors. One such approach was a strategy undertaken by Gagliardi et al. (2004), in which predictor variables were classified on the basis of whether or not a given trait was associated with a probability of occurrence of violent and criminal recidivism that was significantly greater or lower than the sample baseline (i.e., base rate).

Despite widespread agreement that protective factors should be considered when forecasting risk for violence, relatively few researchers have sought to empirically examine the impact of protective factors on risk classification in the presence of risk factors (Rogers, 2000). Nonetheless, the handful of researchers who have undertaken such endeavors have demonstrated the presence of protective factors to be associated with decreased risk even in the presence of compelling risk factors (Gagliardi et al., 2004, Plutchik, 1995). Future research is necessary to identify pertinent protective factors across populations and context and to assess their impact on the accuracy of risk estimates.

In a similar vein, the vast majority of researchers have examined static risk factors to the exclusion of dynamic risk factors (Douglas & Skeem, 2005; Rogers, 2000). Douglas and Skeem (2005) described the majority of violence risk research as focused on *risk status*, which they defined as placing emphasis on static risk factors for violence that "[leave] little room for change in risk over time" (p. 384). These authors contended that researchers must examine *risk state*, which focuses on the fluctuation of both static and dynamic risk factors over time. Thus, the current state of risk assessment research and practice may serve to promote an overly negativistic image of unremitting and unalterable risk for future violent and criminal offending among forensic and correctional populations (Rogers, 2000). Indeed, the failure of researchers and practitioners to consider changeable risk factors (i.e., dynamic risk factors) leaves little guidance in regards to violence prevention strategies, which as Hart (1998) has reminded, should be the purpose of conducting risk assessments.

PURPOSE OF THE CURRENT STUDY

The current study included several aims, foremost of which was to contribute to the growing literature base regarding correctional risk assessment and the classification/triage of violence risk among newly incarcerated offenders. As such, a research design was initiated that was intended to improve upon the methodological shortcomings of many prior empirical investigations into violent and disruptive behaviors among incarcerated populations. It was hoped that a large-scale prospective investigation into the long-term behaviors of male and female general population offenders across a variety of ethnicities would provide important information regarding correctional risk assessment as it is most often undertaken in clinical practice. The study design also facilitated investigation into the strength of individual empirical correlates of violent and disruptive behaviors occurring in correctional institutions among a sample composed of general population incarcerated offenders. Though a secondary aim, the diverse sample further allowed for examination of PAI scale means and trends across various offender subgroups.

A second purpose of the current study was to examine the utility of the PAI in the classification/triage of risk for clearly defined categories of problematic institutional behaviors. In addition to testing the predictive validity of PAI scales that had previously undergone limited empirical scrutiny in the prediction of institutional misconduct (e.g., AGG and ANT), I sought to examine several previously uninvestigated scales that were designed to assess personality traits and psychopathology levels that have subsequently been linked with violent and antisocial behaviors. This study also represented the first known investigation into the predictive utility of PAI subscales among incarcerated populations.

A third major aim was to examine the relationship between several historical and demographic variables and violent and disruptive institutional behaviors. In addition to testing the strength of relationship between problematic institutional behaviors and rarely examined variables (e.g., gang affiliation), investigation of the utility of several well-established risk factors for violence in the community to forecast future violent and antisocial behaviors among incarcerated offenders was undertaken. Inclusion of PAI scale and demographic/historical variables facilitated univariate empirical examination of static and dynamic risk and protective factors for problematic institutional behaviors.

A final purpose of the current study was to develop and test a multivariate prediction scheme aimed at forecasting inmate risk for violent institutional behaviors for use with a variety of incarcerated offender groups. Composed of the strongest univariate predictor variables, including identified risk and protective factors for future violent behaviors, I sought to combine self-report and historical/demographic information into one prediction scheme. In addition to assessing the validity and practical utility of this measure with general population offenders, an aim of this undertaking was to investigate whether self-report information (i.e., PAI) could increase accuracy in the prediction of violent behaviors above risk estimates based solely on historical and demographic variables. Likewise, the development of a violent behavior prediction scheme was undertaken to examine the effect of including dynamic risk variables on the accuracy of prediction.

Hypotheses

Because little research has explicitly addressed many components of the current study with a similar population, the current investigation was primarily exploratory in nature. Nonetheless, on the basis of existing research, a few a priori hypotheses were developed and tested:

1) PAI scales that previous researchers have found to be related to violence risk with various subpopulations of incarcerated offenders (e.g., individuals convicted of sex offenses) will display significant positive associations with yearly rates of infraction and will be significant predictors of adjudication for each category of infraction. These scales were AGG, ANT, BOR, and VPI.
2) Several previously unexamined scales that assess traits consistent with empirically identified risk factors for antisocial and violent behaviors will display significant associations with yearly rates of infraction and will be significant predictors of adjudication for each category of infraction. The purposed scales were MAN, PAR, DOM, and RXR.
3) PAI scales that contain content-relevant items regarding violent behaviors will be the strongest individual predictors of adjudication for a physically aggressive/violent infraction (i.e., ANT, AGG, and VPI).
4) Subject age will be negatively associated with adjudication for all categories of institutional infraction and will be the most robust individual predictor of physically aggressive/violent infractions across all variables.
5) Gang affiliation status will be a significant predictor of adjudication for each category of institutional infraction, with individuals who are deemed to be

affiliated with a gang demonstrating significantly higher rates of adjudication than individuals with no known gang affiliation.

6) A violent index offense will not be a significant predictor of adjudication for physically aggressive/violent infractions.

METHOD

Subjects

Inclusion Criteria

The subjects for this study were male and female inmates incarcerated within any Oregon Department of Corrections (ODOC) adult correctional facility who had completed a PAI as a standard part of ODOC intake procedures between August 10, 2000, and January 31, 2006, upon admission to the ODOC intake and assessment center (IAC). The IAC was developed to assist ODOC officials in making housing, security classification, and programming decisions for newly incarcerated individuals by providing several services: comprehensive medical, dental, psychological, and educational assessments; short-term housing; and inmate orientation and information gathering sessions. Male subjects spent an average of 3 to 4 weeks at the IAC before being transferred to long-term housing in an ODOC facility that was designated according to security classification and the results of several intake needs assessments. Because the complex that houses the IAC also houses the only long-term correctional institution for females in ODOC, female inmates completed intake and assessment proceedings within a female medium security facility.

As part of a number of assessments and interviews aimed at identifying the security, medical, and educational needs of newly incarcerated offenders, each subject with at least a fourth-grade reading level completed the PAI for the purpose of screening for mental health problems. Subjects who displayed clinically significant elevations on PAI scale and subscales associated with serious mental illness, as well as those who produced invalid PAI profiles or endorsed critical items (i.e., items that suggested an immediate danger to self or others) were subsequently evaluated by a mental health counselor to assess mental status and make treatment referrals. To ensure that each subject's reading level met the required fourth-grade threshold recommended by Morey (2003), an educational assessment that included reading ability was completed by prison educational staff prior to the administration of the PAI. Depending on the primary language of each subject, Spanish and English versions of the PAI were available for administration; however, because the PAI has yet to be validated in other languages, inmates whose primary language was other than English or Spanish did not complete the PAI. Inmates who were unable to complete the PAI due to reading ability or a primary language other than English or Spanish were automatically evaluated by a mental health counselor to ensure that mental health needs were assessed prior to inmate classification or housing decisions.

An initial sample of 17,902 individuals was obtained through the above process. In order to ensure that all subjects had an adequate time to adjust to incarceration, subjects who were incarcerated less than a total of 180 days were excluded from the study (n = 779). In general, Morey (2003) has recommended that clinicians not interpret PAI profiles with 18 or more unanswered items (i.e., 5%), because increased numbers of missing items compromise interpretation accuracy. An additional 69 subjects were excluded due to missing more than 5% of items, resulting in a final sample of 17,054 subjects.

Subject Demographics

With the exception of age, all historical, demographic, and institutional classification variables (e.g., mental health classification, gang affiliation, etc.) were obtained through inmate-staff interview and state and federal record reviews as part of ODOC intake procedures. In order to provide consistency across the sample, age was calculated from the date of PAI administration and institutional records of subject date of birth. Demographics of the sample are shown in Table 2. As seen in the table, age ranged from 16 to 81, with a mean age of 33 (*SD* = 10.35); however, when categorized according to age groups, subjects who were 21 to 25 constituted the highest proportion of subjects.

As previously noted, the PAI is employed by ODOC as a general mental health screening instrument. Inmates who display clinically elevated or invalid PAI profiles, as well as those endorsing critical items, are subsequently referred for a face-to-face mental health evaluation by mental health counselor. Likewise, inmates who enter the IAC on psychotropic medications are automatically referred for a mental health and medication evaluation. According to Clements (1996), the use of objective, well-validated measures to assist in inmate classification are necessary if correctional agencies are to avoid resource wasteful practices. Given the high volume of inmates entering ODOC facilities, a face-to-face mental health screening for every inmate would require significantly greater resources than are available and would inevitably create a backlog of inmates awaiting mental health evaluation in the IAC. However, the implementation of PAI clinical elevations and critical item endorsement as a general mental health screening appears to be effective in conserving mental health staff resources, given that only 33.8%

Table 2
Self-Reported Age, Gender, and Ethnicity of Subjects

Variable	*n*	%
Gender		
Male	15,065	88.3
Female	1,989	11.7
Ethnicity		
White	14,364	84.2
Black	1,474	8.6
Hispanic	725	4.3
Native American	336	2.0
Asian	153	0.9
Undocumented	2	< 0.01
Age		
Under 18	65	0.4
18 to 20	1,702	10.0
21 to 25	3,254	19.1
26 to 30	2,648	15.5
31 to 35	2,775	16.3
36 to 40	2,610	15.3
41 to 45	1,917	11.2
46 to 50	1,114	6.5
51 to 55	520	3.0
56 and Above	448	2.6
Undocumented	1	<0.01

Note. N = 17,054.

of subjects (n = 5,757) in the current study required a follow-up face-to-face evaluation.

Of subjects who were subsequently evaluated by a mental health staff counselor while at the IAC, 19.3% were labeled as having no identifiable mental health need (i.e., the presence of mental illness was not substantiated by interview), 45.6% were diagnosed with a mild or acute mental disorder that was deemed unlikely to significantly impact long-term adjustment to incarceration (e.g., adjustment disorder, social phobia, intermittent explosive disorder, attention-deficit/hyperactive disorder, etc.), and 35.1% were identified as having at least one chronic or serious mental illness that was likely to significantly impact long-term adjustment to incarceration (e.g., psychotic-spectrum disorder, borderline personality disorder, posttraumatic stress disorder, major depressive disorder, etc.). Taken together, 27.2% of all subjects were classified as having some sort of mental health need, with 11.9% classified as meeting criteria for a chronic or serious mental illness (see Table 3).

To assist in classification and programming decisions, each inmate housed within the IAC is also assessed for chemical dependency treatment needs. Treatment need is determined through a combination of a self-report measure of prior substance abuse/dependence and an interview with a trained correctional intake counselor. Inmates are placed into one of four categories that addressed the intersection of chemical dependency and criminal behaviors. In this sample, 42.1% of subjects were identified as having little to no history of substance abuse/dependency impeding their functioning in the community. Almost 40% of subjects were identified as having experienced serious impact in community functioning due to substance use that was directly linked to their criminal behaviors (i.e., they were under the influence during index offense or committed

Table 3
Intake Mental Health Status of Subjects

Mental Health Status	*n*	%
No known mental health need	12,409	72.8
Less severe mental illness, mild impact on functioning	2,623	15.4
Serious or chronic mental illness	2,022	11.9

Note. *N* = 17,054. Due to rounding error, total percentage does not equal 100%.

the offense to obtain a substance). Considered to have similar links between substance dependence and criminal behaviors, but classified differently, 8.3% of subjects were court mandated to complete chemical dependency treatment while incarcerated (see Table 4).

The seriousness of index offense ranged from felony driving under the influence of drugs or alcohol (DUI) and parole violations to aggravated murder, rape, and child sexual abuse across the sample. When classified according to person, property, and statutory offenses, the largest group of subjects was incarcerated for crimes against persons (45.2%). Just fewer than 30% of subjects were incarcerated for property crimes, and 25.7% had been convicted of statutory offenses such as drug crimes or illegal weapons possession (see Table 5).

As noted previously, all inmates who completed a PAI upon admission to the IAC and who were incarcerated for a minimum of 6 months were included in the sample. The period of study was from August 10, 2000, to January 31, 2006, which equaled a

Table 4
Intake Chemical Dependency Classification of Sample

Substance Abuse Need Classification	*n*	%
Minimal symptomatology/no history of chemical dependency	7,188	42.1
Chemically dependent/substance not involved with index offense	1,938	11.4
Chemically dependent/substance involved with index offense	6,515	38.2
Court mandated to complete chemical dependency treatment [a]	1,413	8.3

Note. *N* = 17,054.
[a] The court-mandated treatment group was classified as exhibiting similar levels of functional impairment and substance-use-related criminal behaviors as the third group; however, because of programming decisions, ODOC categorizes those who are mandated to treatment while incarcerated separately from non-mandated subjects.

Table 5
Index Offense Categories of Sample

Index Offense	*n*	%
Crime against a person	7,704	45.2
Property crime	4,949	29.0
Statutory crime	4,381	25.7
Undocumented	20	0.01

Note. *N* = 17,054.

total of 2000 days (5.48 years). Because individuals with fewer than 180 days of incarceration were excluded from participation to allow adequate adjustment to incarceration, the follow-up period after PAI administration for subjects ranged from 180 to 2000 days of incarceration. The mean time incarcerated across subjects equaled about 606 days (1.66 years). When grouped according to categories, the most common number of days served was between 180 days and 1 year (37.4% of subjects) during the study period (see Table 6).

Although the mean number of prior incarcerations was 1.23 across the sample, the majority of subjects had not previously been incarcerated (55.4%). The sample displayed a wide range of number of prior incarcerations (0 to 19); however, the range appeared to be artificially inflated by a small percentage of individuals with a very large number of previous incarcerations, because almost 95% of subjects had been incarcerated five or fewer times (see Table 7).

As part of the ODOC offender classification process, each inmate is screened for ties to any street or prison gangs. Individuals who are identified as potentially gang-affiliated through self-report, tattoos, and criminal history are interviewed by an ODOC security threat group specialist who classifies subjects according to three ODOC gang affiliation levels: unaffiliated, affiliated, and highly affiliated (i.e., a high degree of involvement in gang activities when compared to other affiliates). As can be seen in Table 8, more than 90% of subjects had no known gang affiliation at intake. When broken down according to gender, 90% of male subjects and 97.7% of female subjects were classified as unaffiliated.

Table 6
Time Incarcerated for Current Conviction

Time Incarcerated	*n*	%	Cumulative %
6 months to 1 year	6,375	37.4	37.4
1 to 2 years	6,166	36.2	73.6
2 to 3 years	2,232	13.1	86.7
3 to 4 years	1,251	7.3	94.0
4 to 5 years	740	4.3	97.3
5 to 6 years	290	1.7	100.0

Note. *N* = 17,054.

Table 7
Number of Previous Incarcerations

Number of Previous Incarcerations	*n*	%	Cumulative %
0	9,427	55.3	55.3
1	3,113	18.3	73.6
2	1,627	9.5	83.1
3	971	5.7	88.8
4	619	3.6	92.4
5	414	2.4	94.8
6 to 10	768	4.5	99.3
11 or more	115	0.7	100.0

Note. *N* = 17,054.

Table 8
Gang Affiliation of Sample

Gang Affiliation	Males		Females		Total	
	%	*n*	%	*n*	%	*n*
No known affiliation	90.0	13,557	97.7	1,943	90.9	15,500
Affiliated	9.4	1,422	2.3	45	8.6	1,467
Highly affiliated	0.6	86	0.1	1	0.5	87

Note. N = 17,054.

Measures

Personality Assessment Inventory (PAI)

As previously described, the PAI is an objective multiscale self-report personality measure that was designed to assess a number of personality and psychopathological variables (Morey, 2003). Briefly, the PAI was developed to provide useful clinical information across a wide variety of professional settings. The PAI is made up of 344 Likert-type items that comprise 22 non-overlapping scales. Four validity scales were developed to assess careless, random, or idiosyncratic responding patterns, as well as intentional symptom distortion. Eleven clinical scales were derived to correspond to the major categories of current diagnostic nosology (i.e., *DSM*), with item content covering the major facets of each clinical construct (Morey, 1996, 2003). Five treatment scales are related to treatment and case management variables and two interpersonal scales assess interpersonal functioning (Morey, 2003). Several conceptually derived subscales that were designed to increase the breadth of coverage across clinical, treatment, and interpersonal constructs are used to aid interpretation (Morey, 1996; see Appendix A).

Additionally, internally generated scales have been developed to assist in the assessment of malingering, suicide risk, and violence potential.

Typically requiring less than 1 hr to complete, the PAI can be administered in group or individual formats (Morey, 2003). The reliability and validity of the PAI has been demonstrated across a wide variety of clinical settings (Morey, 1996, 2003), including correctional and forensic settings (Douglas et al., 2001; Edens, Cruise, et al., 2001; Rogers, 2003). Likewise, a Spanish version of the PAI has been developed and validated for use with Spanish-speaking populations (Fantoni-Salvador & Rogers, 1997; Rogers, et al., 1995). More recently, researchers have demonstrated utility of the PAI in the prediction of aggression, institutional adjustment, and recidivism among incarcerated offenders (Edens et al., 2000; Edens & Ruiz, 2005; Wang & Diamond, 1999; Walters et al., 2003).

The PAI was administered in group format to all subjects soon after admission to the IAC (i.e., typically within first or second day of incarceration). Responses were scored with an ODOC computer scoring program and the results were included in each inmate's institutional record.

Disciplinary Infractions

The frequency and severity of institutional disciplinary violations were tracked for each subject for all days of incarceration during the study period. The *ODOC Handbook for Rules of Prohibited Conduct* (2002) includes a total of 41 individual institutional infractions according to four levels of prohibited behavior (see Table 9). However, because each ODOC infraction level reflects a variety of infraction types and severity, the ODOC classification scheme did not appear to reliably isolate the specific behaviors

Table 9
Oregon Department of Corrections (2002) Categories of Institutional Infractions

Category of Misconduct	Examples of Infractions Within Category
Violations Involving Property	Arson, Property Destruction, Contraband
Violation Against Persons	Assault, Disrespect, Extortion, Tattooing
Violations Involving Fraud or Deception	Bribery, Forgery, Fraud, Gambling
Violations Against Orderly Operations	Disobedience, Weapon Possession, Escape

under current investigation. For example, infraction types within the “Violations Against Persons” category include physically violent acts (e.g., Assault), verbally aggressive acts (e.g., Harassment), and nonaggressive acts (e.g., Tattooing). Similar concerns have been noted by several authors who have criticized prior researchers for failing to sufficiently operationalize specific types of institutional behaviors and instead using poorly defined categories of infractions (e.g., major vs. minor infractions) or combining all infractions into one catchall outcome variable (Cunningham & Reidy, 1998a). Due to these concerns, an a priori classification scheme was developed to allow for the examination of specific constellations of inmate behaviors that could easily be defined. Utilizing procedures developed by Buffington-Vollum et al. (2002) and Edens et al. (1999) as a guide, institutional infractions were classified according to three categories of severity: physical aggression/violent (PA), verbal aggression/acts of defiance (VA), and nonaggressive/nonviolent (NA) infractions. The total number of violations within each infraction category and the total number of institutional infractions across categories were tracked for each subject (see Table 10 for a description of these categories).

Table 10
A Priori Classification of Institutional Infractions

PA	VA	NA
Arson	Destruction of Property	Bribery
Assault	Disobedience of an Order	Contraband
Extortion	Disrespect	Distribution
Hostage Taking	Creating a Disturbance	Employee/Inmate Relationship
Sexual Assault	Harassment	Escape
Sexual Coercion	Weapon/Escape Device Possession	Giving False Information to an Employee
		Fraud
		Gambling
		Nonaggressive Sexual Activity
		Tattooing/Body-Modification
		Unauthorized Area
		Unauthorized Departure
		Unauthorized Use of a Computer
		Unauthorized Organization

Note. Many infraction types are also further classified according to severity levels (e.g., Assault I, Assault III, etc.); however, the inclusion of infraction severity classifications did not affect the organization of the above infraction categories. PA= Physically Aggressive/Violent; VA= Verbally Aggressive/Acts of Defiance; NA= Nonaggressive/Nonviolent.

Because subjects were incarcerated for a wide range of time periods, it was essential that the effect of time incarcerated on the number of disciplinary infractions be taken into account. That is, the longer a subject was incarcerated, the greater the opportunity he or she had to commit an infraction. As such, institutional infractions were standardized for each subject according to the average number of violations per year of incarceration. To accomplish this task, the total number of infractions was divided by the total number of days incarcerated and multiplied by 365, providing a standardized yearly infraction rate. This rate was calculated for each infraction category and for the total number of infractions of each subject. When examining whether a subject had committed an infraction or a specific infraction type, the amount of time incarcerated was statistically controlled because such analyses did not allow for the use of a standardized infraction rate.

Procedure

All data for this study were obtained and coded from ODOC institutional records provided by ODOC officials. Although the data were archival in nature, because predictors (e.g., PAI) were obtained upon admission to ODOC custody and therefore were collected before the criterion of interest (institutional infractions), a prospective/longitudinal research design was undertaken. Official records of institutional violations were obtained for each subject for the course of their entire incarceration, or until the study end date. The date and type of violation were collected for each infraction and categorized according to the a priori classification scheme previously discussed. Only those violations for which a subject had either pled or been found guilty by an institutional adjudication officer were examined in this study.

PAI Validity

Profile validity must be taken into account when interpreting self-report measures such as the PAI, particularly when administered in forensic and correctional environments. In order to ensure that intentional symptom distortion, careless responding, and idiosyncratic response patterns did not affect the results, those subjects with markedly elevated PAI validity scale scores were excluded from examination when considering PAI clinical, treatment, or interpersonal scales. PAI profiles were deemed invalid if one or more validity scales were elevated beyond the uninterpretable threshold recommended by Morey (2003): ICN $\geq$ 73, INF $\geq$75, NIM $\geq$ 92, and PIM $\geq$ 68. This strategy resulted in an invalid rate of 14% (*n* = 2,383), with only 11% of invalid profiles displaying more than one markedly elevated validity scale (*n* = 264); no subjects displayed markedly elevated scores on all four validity scales. As can be seen in Table 11, an invalid PIM elevation was the most frequent reason for invalid profiles.

Data for subjects who completed invalid profiles were not excluded when examining the relationship between PAI validity scales and institutional behaviors. The removal of subjects who demonstrated clinically elevated validity scales would have invariably constricted the range of validity scale scores, which would have likely resulted in deflated effect sizes when examining the effect of validity scales on institutional behaviors. Similarly, all subjects were included when examining PAI validity scales in combination with other PAI scales and historical and/or demographic variables. Thus, a two-sample approach was taken, with the sample size varying according to the variables under examination.

Table 11
Frequency of Invalid PAI Validity Scale Elevations

Validity Scale	(cutoff)	*n*	% of Total Sample [a]	% of Invalid Profiles [b]
ICN	(≥ 73)	400	2.3	16.8
INF	(≥ 75)	791	4.6	33.2
NIM	(≥ 92)	526	3.1	22.1
PIM	(≥ 68)	963	5.6	40.4

[a] N = 17,054; [b] N = 2,383.

Potential Major Mental Illness

As noted earlier, Guyton et al. (2006) recently demonstrated clinical elevations on PAI scales associated with major mental illness to be a risk factor for institutional maladjustment. To allow for further examination of the impact of potential major mental illness as classified by the PAI scale elevations on institutional adjustment, a comparable procedure was undertaken to identify inmates whose PAI scale fluctuations were suggestive of symptomatology consistent with major mental illness. Potential major mental illness was defined as having marked elevations on one or more of four scales associated with serious and persistent mental illness: MAN, PAR, SCZ, and BOR. Marked elevation was determined using cutoffs recommenced by Morey (2003) that represented the point at which scale elevation is considered to be reflective of active and/or persistent symptomatology associated with the particular construct under investigation: MAN > 75, PAR > 84, SCZ > 90, or BOR > 90. This classification strategy resulted in 1,016 subjects' PAI profiles being classified as reflective of potential major mental illness (6.0%; see Table 12). Examination of valid profiles reduced the

Table 12
Frequency of Potential Major Mental Illness as Classified by PAI Scale Elevations

Scale	(cutoff)	Total Sample [a]		Valid Profiles [b]		% reduction in classification
		n	%	*n*	%	
MAN	(> 75)	398	2.3	291	2.0	26.9
PAR	(> 84)	444	2.6	229	1.6	48.4
SCZ	(> 90)	325	1.9	92	0.6	71.7
BOR	(> 90)	274	1.6	138	0.9	49.6
Any Scale		1,016	6.0	631	4.3	37.9

[a] N = 17,054; [b] N = 14,671.

number of subjects classified as potentially seriously mentally ill to 631 (4.3%). Discarding invalid profiles resulted in a reduction of in the number of subjects classified as seriously mentally ill by almost 40%. As with non-validity PAI scale analyses, only subjects who completed valid profiles were included when considering potential major mental illness.

Violence Potential and Suicide Potential Indexes

A final procedural step was undertaken to generate the PAI VPI scale, which was described in more detail in a previous section, and the Suicide Potential Index (SPI), which is an internally generated scale assessing factors associated with elevated risk for suicide (Morey, 1996). Although ODOC officials maintained records of all subjects' PAI validity, clinical, treatment, and interpersonal scales and subscales, a record of subject VPI and SPI scores were not kept. However, because the VPI and SPI are based solely upon the configuration of scores among other PAI scales, it was possible to generate VPI (see Table 1 [p. 108] for VPI components) and SPI (see Table 13) scores from the

Table 13
Suicide Potential Index Components

Violence Risk Factor	PAI Marker
1. Severe psychic anxiety	ANX-C > 60*T*
2. Severe anhedonia	DEP-A > 65*T*
3. Global insomnia	DEP-P > 60*T*
4. Diminished concentration	SCZ-T > 60*T*
5. Indecision, OCD features, rigidity, perfectionism	ARD-O > 55*T*
6. Acute overuse of alcohol	ALC > 60*T*
7. Panic attacks	AXN-P > 60*T*
8. Cycling affective disorder	MAN-A 55*T*
9. No children in the home, little chance rescue or interruption	NON > 60*T*
10. Concomitant drug abuse	DRG > 60*T*
11. Acute interpersonal disruption	BOR > 65*T*
12. Intensity of current stress	STR > 65*T*
13. Poor impulse control	BOR-S > 60*T*
14. Anger held in	AGG-P minus AGG-V > 10*T*
15. Hopelessness	DEP-C > 65*T*
16. Mistrust	PAR-H > 60*T*
17. Withdrawal, isolation	WRM < 45*T*
18. Worthlessness	MAN-G < 45*T*
19. Mood fluctuations	BOR-A > 65*T*
20. Somatic problems	SOM-H > 55*T*

Note. From Morey (1996, p. 202).

existing data. Thus, VPI and SPI raw scores for each subject were calculated based on each subject's profile configuration, and *T*-score conversions were obtained from Morey (1996).

RESULTS

Institutional Infractions

A total of 19,679 disciplinary infractions were recorded during the study period, with a mean time incarcerated of 606 days (*SD* = 409) across the sample. Across all subjects, 34.4% of the sample committed at least one infraction during that time period. When broken down according to infraction type, 7.5% committed at least one physically aggressive/violent infraction. As can be seen in Table 14, males displayed higher infraction rates than females across infraction types, with fewer than 4% of female subjects committing a violent infraction.

The total number of infractions ranged from no infractions to 73 infractions. Although the mean number of infractions across the sample was 1.15 (*SD* = 2.97), the majority of subjects did not commit an infraction during the study period (*Median* and *Mode* = 0; see Table 15). When reorganized according to yearly infraction rates, a mean of 0.83 infractions (*SD* = 1.96) per year of incarceration was observed across subjects. Among infraction types, verbally aggressive/defiant infraction had the highest rate of occurrence (*M* = 0.41; *SD* = 1.40). As with total infractions across incarceration, a few outliers displayed an extremely high rate of total infractions; however, the range of physically aggressive/violent yearly infraction rates was much more compressed, ranging from 0 to about 5 (see Table 16).

Table 14
Institutional Infraction Base Rates

Infraction Category	Males [a]		Females [b]		Total [c]	
	%	*n*	%	*n*	%	*n*
Physically Aggressive/Violent	8.0	1,203	3.9	78	7.5	1,281
Verbally Aggressive/Defiant	22.9	3,448	18.4	365	22.4	3,383
Nonaggressive/Nonviolent	24.4	3,673	18.0	359	23.6	4,032
Any Infraction	35.4	5,334	27.0	537	34.4	5,871

[a] n = 15,065; [b] n = 1,989; [c] N = 17,054

Table 15
Total Infractions Across Incarceration

Infraction Category	*M*	*SD*	*Min*	*Max*
Physically Aggressive/Violent	0.11	0.42	0	9
Verbally Aggressive/Defiant	0.59	2.10	0	66
Nonaggressive/Nonviolent	0.46	1.08	0	20
All Infractions	1.15	2.97	0	73

Note. Mean time incarcerated = 606 days. N = 17,054.

Table 16
Infraction Rate per Year of Incarceration

Infraction Category	*M*	*SD*	*Min*	*Max*
Physically Aggressive/Violent	0.07	0.29	0	5.03
Verbally Aggressive/Defiant	0.41	1.40	0	44.84
Nonaggressive/Nonviolent	0.34	0.80	0	10.36
All Infractions	0.83	1.96	0	53.19

Note. N = 17,054.

Correlational analyses revealed significant positive relationships among yearly rates of each infraction category, such that higher yearly rates in one category of infraction were associated with higher rates in the other two categories (see Table 17).

Effects of Gender

An independent samples *t*-test was run to determine whether physically aggressive/violent infraction rates differed for male and female subjects. Before that analysis was conducted, a Levene's test of equality of variance was run. The result was significant (F = 94.48, p < .001), indicating that the assumption of homogeneity of variance was violated and a more stringent alpha level should be adopted; however, because even small differences in group variances among large sample sizes can erroneously produce a significant Levene's test (Field, 2005), a variance ratio was calculated. This statistic indicated that the assumption of equal variances was not violated (*variance ratio* = 1.7), and thus the adoption of a more stringent alpha was not necessary before proceeding.

Significant differences were found between male and female physically aggressive/violent infraction rates (t[17052] = - 4.97, p < .001], with male subjects (M = 0.75, SD = 0.302) displaying significantly higher yearly rates of physically aggressive/violent infractions than female subjects (M = 0.40, SD = .23). As can be seen in Table 18, nonaggressive/defiant and total yearly infraction rates were also significantly higher for males than females across all infraction types. Significant differences were not found between male and female verbally aggressive/defiant yearly infraction rates (p = .053). Odds ratio analyses were undertaken after controlling for the amount of time incarcerated: these revealed a similar pattern, with male subjects being 2.08 times more

Table 17

Intercorrelations Among Yearly Rates of Infraction

Infraction Type	PA	VA	NA	Total
PA	---	.398***	.185***	.510***
VA		---	.329***	.909***
NA			---	.672***
Total				---

Note. PA = Physically Aggressive/Violent; VA = Verbally Aggressive/Defiant; NA = Nonaggressive/Nonviolent.
*** $p < .001$.

Table 18

Gender Differences in Yearly Infraction Rate and Odds of Committing at Least One Infraction by Gender

	Male [a]		Female [b]			*Odds* [d]
Infraction Category	*M*	*SD*	*M*	*SD*	t [c]	*Ratio*
PA	0.750	0.302	0.401	0.227	- 4.970**	2.08
VA	0.422	1.406	0.357	1.363	- 1.935	1.35
NA	0.357	0.820	0.239	0.658	- 6.158**	1.52
Any	0.854	1.975	0.636	1.866	- 6.646**	1.59

Note. PA = Physically Aggressive/Violent; VA = Verbally Aggressive/Defiant; NA = Nonaggressive/Nonviolent.
[a] n = 15,065; [b] n = 1,989; [c] df = 17052 ; [d] *Odds ratio* = male : female after controlling for time served.
** $p < .001$.

likely than female subjects to commit at least one physically aggressive/violent infraction while incarcerated after controlling for the variance associated with the number of days incarcerated.

Effects of Age

A series of Pearson's correlation coefficients were run to examine the relationship between age and yearly infraction rates. Significant negative correlations were found between age and each infraction category such that as age increased, yearly rates of physically aggressive/violent ($r = -.132$, $p < .001$), verbally aggressive/defiant ($r = -.129$, $p < .001$), and nonaggressive/nonviolent infractions ($r = -.112$, $p < .001$) decreased. As can be seen in Figure 2, yearly rates of all infractions decreased as age increased ($r = -.157$, $p < .001$). A similar pattern was found when examining the relationship between the base rate of committing any infraction during the study period and age ($r = -.128$, $p < .001$), such that the overall percentage of individuals who committed any type of infraction was highest at younger ages and degreased as age increased (see Figure 3). An analogous relationship was found when considering the base rate of physically aggressive/violent infractions (r = -.140, $p <$ 001; see Figures 4 and 5).

To further assess the impact of age on problematic behaviors, odds ratios were calculated to determine the likelihood of committing at least one infraction during incarceration after controlling for the variance associated with the number of days incarcerated. Subjects were categorized into two age groups, with age 31 set as the cut point between groups. This age was selected solely because it represented the 50^{th} percentile in the distribution of subject age (a future section will discuss procedures to identify the optimal operating point of age in the prediction of institutional misconduct).

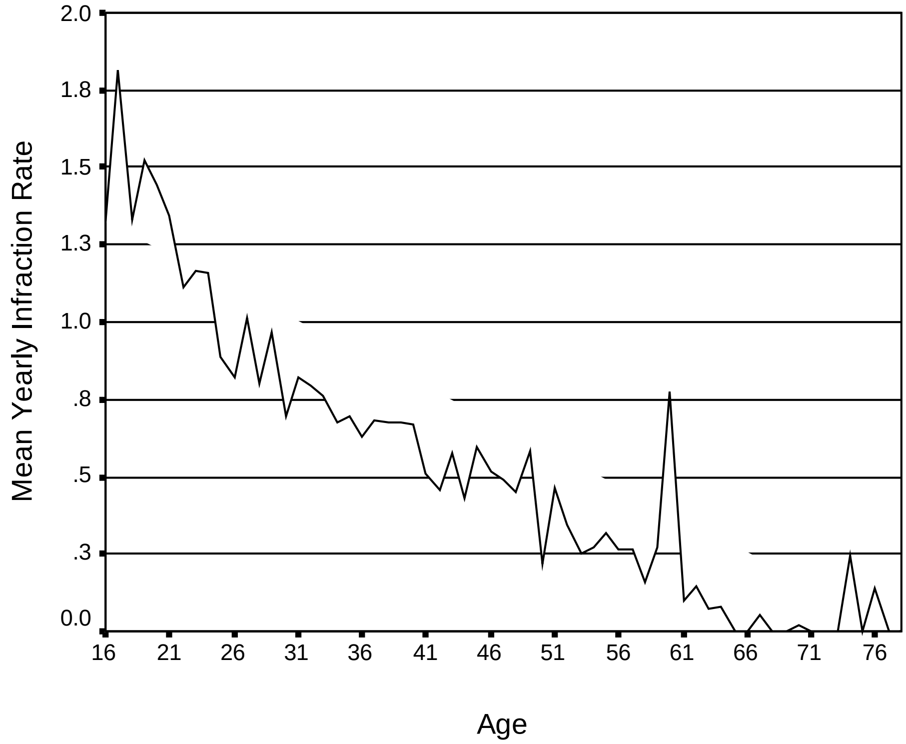


Figure 2. Yearly rate of adjudication for any infraction by age (r = - .157, p < .001)[3]

Individuals who were aged 31 years or younger were 2.5 times more likely to commit at least one infraction during incarcerations than individuals ages 32 and older. As can be seen in Table 19, those individuals under age 32 were more likely to commit an infraction than those 32 and older across all infraction categories; however, the magnitude depended heavily upon the infraction category under investigation.

[3] Further exploration into the unexpected spike found for age 60 (n = 34) revealed the mean yearly infraction rate (M = 0.82) to be inflated due to the influence of one subject with a yearly infraction rate of 14.04. Removal of this individual from the analysis resulted in a mean yearly infraction rate of 0.37 for age 60, which followed the expected direction. Single outliers were also found to have inflated infraction rates at ages 74 (n = 6) and 76 (n = 4).

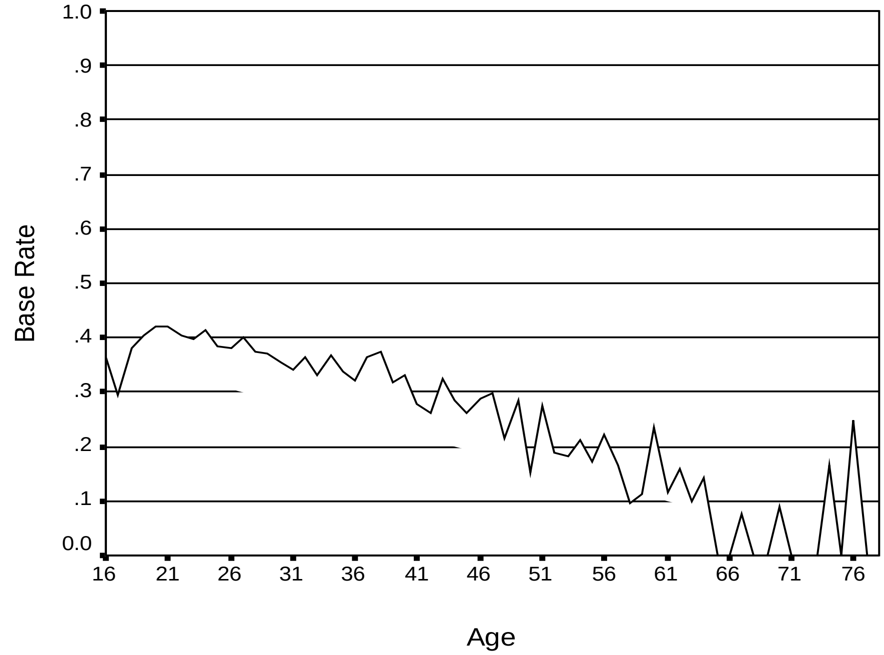


Figure 3. Base rate of adjudication for any infraction by age

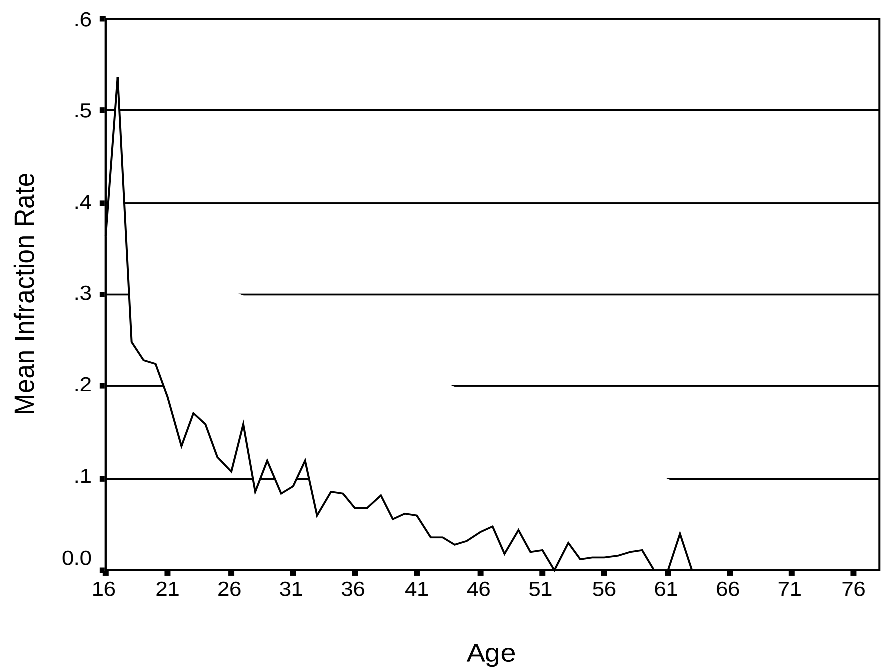


Figure 4. Yearly rate of adjudication for a physically aggressive/violent infraction by age (r = - .132, p < .001)

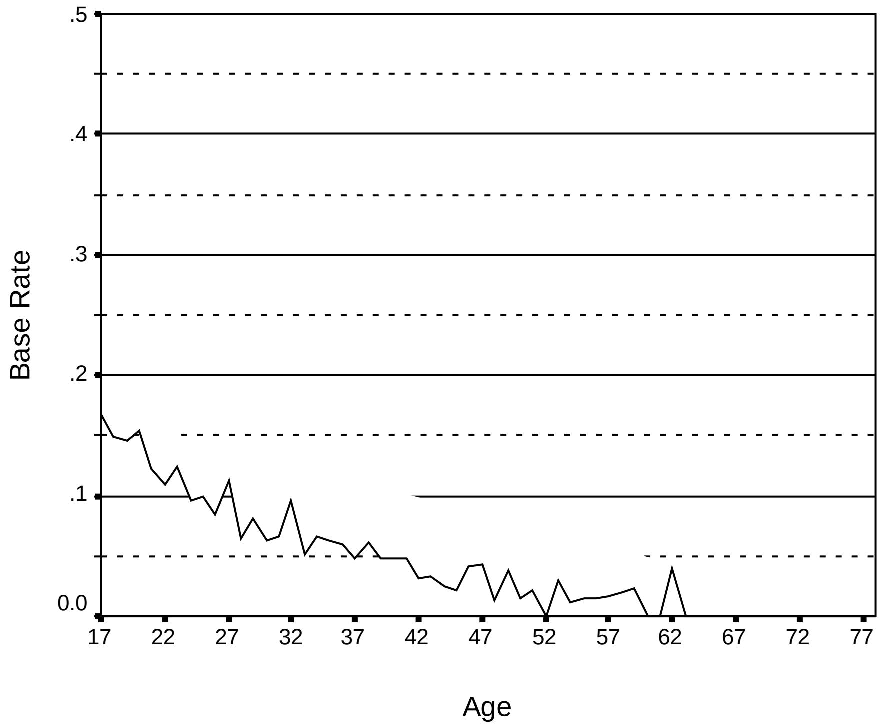


Figure 5. Base rate of adjudication for a physically aggressive/violent infraction by age

Table 19
Odds of Committing at Least One Infraction Among Subjects Ages 31 or Younger Compared to Subjects Ages 32 and Older After Controlling for the Number of Days Incarcerated

Infraction Category	*Odds Ratio* (< 32: ≥ 32)
Physically Aggressive/Violent	2.50
Verbally Aggressive/Defiant	1.85
Nonaggressive/Nonviolent	1.43
Any Infraction	1.50

Index Offense

A one-way analysis of variance (ANOVA) was computed to explore whether mean yearly physically aggressive/violent infraction rates differed depending on the type of index offense. Before the ANOVA was examined for significance, a Levene's test of homogeneity of variance was run, which resulted in a significant finding ($F = 110.50$, $p < .001$); however, a follow-up variance ratio was calculated that suggested the assumption of homogeneity of variance had not been violated (*variance ratio* = 1.9). Nonetheless, a more stringent alpha level was adopted ($p < .01$) to protect against Type I error.

Significant differences were found across offense type ($F[2,17031] = 31.90$, $p < .001$), which indicated that one or more significant differences existed among the three categories of index offense in yearly rate of physically aggressive/violent infractions. To further examine these differences, a post-hoc analysis was run that suggested significantly higher yearly rates of physically aggressive/violent infractions among individuals incarcerated for a property crime ($M = 0.098$, $SD = 0.360$) when compared to those incarcerated for person ($M = 0.056$, $SD = 0.260$; *Tukey's HSD* = .042, $p < .001$) or statutory crimes ($M = 0.065$, $SD = 0.264$; *Tukey's HSD* = .033, $p < .001$). A significant difference was not found when comparing statutory and person index offenses (*Tukey's HSD* = .008, $p = .267$).

Similar analyses were undertaken to determine if differences existed in the yearly rates of infractions across index offense types for the remaining infraction categories. As with physically aggressive/violent infractions, significant differences were found among index offense categories for yearly rates of verbally aggressive/defiant infractions ($F[2, 17031] = 42.816$, $p < .001$), nonaggressive/nonviolent infractions ($F[2,17031] = 213.789$, $p < .001$), and all infractions ($F[2,17031] = 129.311$, $p < .001$). Post-hoc analyses with

Tukey's HSD revealed significant differences in the yearly rates of infractions between all index offense categories ($p < .01$), such that individuals who were incarcerated for property crimes had higher yearly rates of verbally aggressive/defiant infractions, nonaggressive/nonviolent infractions, and total infractions than did individuals who were incarcerated for a statutory offense, who had higher rates of yearly infractions than individuals incarcerated for person crimes (Table 20).

Previous Incarcerations

A Person's correlation coefficient was calculated to examine the relationship between the number of previous incarcerations and yearly infraction rates. Significant weak positive associations were found between the number of prior incarcerations and the yearly rate of nonaggressive/nonviolent infractions ($r = .059$, $p < .001$) and the yearly rate of any infraction ($r = .024$, $p = .005$). No significant associations were found between the number of previous incarcerations and yearly rates of physically aggressive/violent infractions ($r = .004$, $p = .620$) or verbally aggressive/defiant infractions ($r = -.001$, $p = .993$).

An independent samples *t*-test was run to examine whether differences in the mean yearly rates of physically aggressive/violent infractions existed between individuals who had been previously incarcerated and individuals were incarcerated for the first time. Before the analysis was conducted, a Levene's test was calculated ($F = 45.977$, $p < .001$), which suggested that the assumption of homogeneity of variance had been violated. However, as with prior variables, a variance ratio was calculated that suggested this assumption was not violated and that the significant Levene's test was likely due to the large sample size (*variance ratio* = 1.5). Significant differences were found in the rate of

Table 20
Yearly Rate of Institutional Infractions and Index Offense

Infraction Category	Person [a]		Property [b]		Statutory [c]	
	M	*SD*	*M*	*SD*	*M*	*SD*
PA	0.056	0.260	0.099	0.360	0.065	0.264
VA	0.324	1.259	0.559	1.777	0.408	1.129
NA	0.212	0.622	0.503	0.985	0.392	0.820
Any	0.593	1.715	1.161	2.443	0.865	1.684

Note. PA= Physically Aggressive/Violent; VA= Verbally Aggressive/Defiant; NA= Nonaggressive/Nonviolent.
[a] n = 7,704; [b] n = 4,949; [c] n = 4,381.

physically aggressive/violent infraction depending on prior incarceration status (t[17052] = 3.603, $p < .001$), such that individuals who had previously been incarcerated (M = 0.080, SD = 0.308) displayed a significantly higher yearly rate of physically aggressive/violent infractions than did those who were incarcerated for the first time (M = 0.064, SD = 0.283).

Parallel methods were used to examine the relationships among yearly rates of verbally aggressive/defiant infractions, nonaggressive/nonviolent, and any infractions depending on prior incarceration status. As can be seen in Table 21, a similar pattern was found across infraction types, with individuals who were previously incarcerated displaying significantly higher yearly rates of all types of infractions than did individuals who were not previously incarcerated.

Table 21
Yearly Infraction and Previous Incarcerations

Infraction Category	One or More Prior [a]		First Incarceration [b]		
	M	*SD*	*M*	*SD*	t [c]
PA	0.080	0.308	0.064	0.283	- 3.603**
VA	0.439	1.374	0.395	1.423	- 2.036*
NA	0.418	0.880	0.283	0.723	- 10.935**
Any	0.742	1.947	0.937	1.979	- 6.459**

Note. PA= Physically Aggressive/Violent; VA= Verbally Aggressive/Defiant; NA= Nonaggressive/Nonviolent.
[a] N = 7,627; [b] *N* = 9,427; [c] *df* = 17052.
* $p < .05$; ** $p < .001$.

Time Incarcerated

A series of Pearson's correlation coefficients were calculated to examine the relationship between the amount of time incarcerated and yearly rates of infractions. Significant negative associations with the number of days incarcerated were found across each infraction category, such that as the number of days of incarceration increased, the yearly rate of infraction decreased. The strongest relationship with days incarcerated was the yearly rate of nonaggressive/nonviolent infractions (r = -.125, p < .001), followed by the rate of any infraction type (r = -.101, p < .001). Although statistically significant, the weakest associations were between days incarcerated and physically aggressive/violent infraction rates (r = -.041, p < .001) and verbally aggressive/defiant infraction rates (r = -.061, p < .001).

Gang Affiliation

An independent samples *t*-test was conducted to examine the yearly rates of physically aggressive/violent infractions among gang-affiliated subjects and non-affiliated subjects. A Levene's test was calculated first ($F = 985.49$, $p < .001$), which suggested that the assumption of equality of variance had been violated. A follow-up variance ratio was calculated that verified that this assumption had in fact been violated (*variance ratio* = 3.8) and was not solely the result of a large sample size. As such, to reduce the likelihood of Type I error, a more stringent alpha level of .01 was designated before proceeding. A significant difference was found in the yearly rate of physically aggressive/violent infractions ($t[1635.36] = -10.748$, $p < .001$), such that gang-affiliated individuals ($M = .0199$, $SD = 0.509$) displayed significantly higher rates of physically aggressive/violent infractions than non-affiliated individuals ($M = 0.058$, $SD = 0.260$).

Similar procedures were undertaken to examine whether significant differences existed in gang-affiliated and non-affiliated subjects' rates of other infraction types. As with physically aggressive/violent infractions, gang-affiliated individuals had significantly higher yearly rates of verbally aggressive/defiant infractions ($t[1652.60] = -6.398$, $p < .001$), nonaggressive/nonviolent infractions ($t[1724.75] = -6.528$, $p < .001$), and any infraction type ($t[1654.21] = -8.525$, $p < .001$) than did non-affiliated individuals (see Table 22).

To further assess the practical significance of gang affiliation on violent behaviors, an odds ratio was calculated after controlling for the number of days incarcerated that demonstrated gang affiliated individuals to be 3.42 times more likely to have committed a violent infraction than were non-gang affiliated individuals. Of note,

Table 22

Yearly Infraction Rates and Gang Affiliation

Infraction Category	Affiliated [a]		Nonaffiliated [b]		
	M	*SD*	*M*	*SD*	*t*
PA	0.199	0.509	0.058	0.260	- 10.748**
VA	0.755	2.273	0.380	1.277	- 6.398**
NA	0.506	1.052	0.327	0.772	- 6.528**
Any	1.460	3.159	0.766	1.788	- 8.535**

Note. PA= Physically Aggressive/Violent; VA= Verbally Aggressive/Defiant; NA= Nonaggressive/Nonviolent.

[a] n = 1,554; [b] n = 15,500.

** $p < .001$.

although gang-affiliated inmates were more likely to have committed at least one of any type of infraction than were non-gang-affiliated inmates, the magnitude of increased risk varied depending on the infraction category under investigation (see Table 23). For example, despite having a yearly infraction rate for any infraction type of almost twice that of non-gang-affiliated subjects, gang-affiliated subjects displayed only slightly greater odds of committing any infraction during incarceration than did non-gang-affiliated subjects. As can be seen in Table 10, although gang-affiliated individuals made up just 9.1% of the sample, they were responsible for 27% of all physically aggressive/violent infractions, 18% of all verbally aggressive/defiant infractions, 16% of all nonaggressive/nonviolent infractions, and 18% of all reported infractions.

Potential Major Mental Illness

An independent samples *t*-test was run to determine whether physically aggressive/violent infraction rates differed depending on potential major mental illness

Table 23
Odds of Adjudication Among Gang Affiliated Subjects Compared to Non-Gang Affiliated Subjects After Controlling for Time Served

Infraction Category	Odds of Infraction	% of Infractions Attributed to Gang-Affiliates
Physically Aggressive/Violent	3.42	26.73
Verbally Aggressive/Defiant	1.52	18.38
Nonaggressive/Nonviolent	1.44	15.74
Any Infraction	1.28	18.09

Note. Gang-affiliated subjects made up 9.1% of the total sample.

status as classified with the PAI. Before that analysis was conducted, a Levene's test of equality of variance was run. The result was significant (F = 26.08, p < .001), indicating that the assumption of homogeneity of variance was violated; however, a variance ratio was calculated that suggested that a significant Levene's test had been an artifact of a large sample size rather than due to a violation of the assumption of equal variances (*variance ratio* = 1.20). Thus, a more stringent alpha was not adopted before proceeding.

Significant differences were found between potential major mental illness status (t[14669] = - 2.762, p = .006], such that inmates classified as potentially seriously mentally ill (M = 0.010; SD = 0.333) displayed significantly higher yearly rates of physically aggressive/violent infractions than inmates who were not classified as potentially seriously mentally ill (M = 0.067, SD = .228). An odds ratio analysis found that inmates classified as potentially seriously mentally ill were 1.48 times more likely to commit at least one physically aggressive/violent infraction than individuals who were not classified as potentially seriously mentally ill after controlling for the variance associated with the number of days incarcerated. As can be seen in Table 24, significant differences were not found in the yearly rates of verbally aggressive/defiant infractions, nonaggressive/nonviolent infractions, or any infraction. Thus, potential major mental illness as classified with the PAI appeared to only be a risk factor for adjudication for a physically aggressive/violent infraction.

PAI Validity

An independent samples *t*-test was run to determine whether physically aggressive/violent infraction rates differed depending on PAI validity status. Before conducting the *t*-test, a Levene's test of equality of variance was examined that indicated that the assumption of homogeneity of variance had been violated ($F = 23.36$, $p < .001$); however, a variance ratio was calculated that suggested that the significant Levene's test had been an artifact of a large sample size rather than being due to a violation of the assumption of equal variances (*variance ratio* = 1.22). Thus, a more stringent alpha was not adopted before proceeding. Significant differences were found in the yearly rates of physically aggressive/nonviolent infractions ($t[17052] = - 2.553$, $p = .011$), such that inmates who produced invalid PAI profiles ($M = 0.085$, $SD = 0.320$) had a significantly higher rate of physically aggressive/violent infractions than inmates who produced valid PAI profiles ($M = 0.069$, $SD = 0.290$).

As can be seen in Table 25, with the exception of nonaggressive/nonviolent infractions ($t[17052] = - 0.102$, $p = .919$), subjects who produced invalid PAI profiles had significantly higher yearly rates of infractions than subjects who produced valid PAI profiles across infraction categories. However, odds ratio estimates of the likelihood of

Table 24
Yearly Infraction Rates and Potential Major Mental Illness Classification

Infraction Category	Present [a] *M*	Present [a] *SD*	Not Present [b] *M*	Not Present [b] *SD*	*t*
Physically Aggressive/Violent	0.100	0.333	0.067	0.288	- 2.762**
Verbally Aggressive/Defiant	0.476	1.312	0.397	1.395	- 1.443
Nonaggressive/Nonviolent	0.342	0.802	0.375	0.835	- 1.027
Any Infraction	0.806	1.924	0.951	1.805	- 1.861

Note. Only subjects who produced valid PAI profiles included. Present = potential major mentally ill present; Not Present = not classified as potentially seriously mentally ill.
[a] n = 631; [b] n = 14,040.
** $p < .01$.

Table 25
Yearly Infraction Rates and PAI Validity Status

Infraction Category	Valid [a] *M*	Valid [a] *SD*	Invalid [b] *M*	Invalid [b] *SD*	*t*
Physically Aggressive/Violent	0.069	0.290	0.085	0.320	- 2.553*
Verbally Aggressive/Defiant	0.400	1.350	0.502	1.680	- 3.298**
Nonaggressive/Nonviolent	0.343	0.804	0.345	0.802	- 0.102
Any Infraction	0.812	1.919	0.932	2.215	-2.777**

Note. Invalid = marked elevations on one of the following PAI scales: ICN, INF, NIM, or PIM.
[a] n = 14,671; [b] n = 2,383.
* $p < .05$; ** $p < .01$.

adjudication after accounting for the variance associated with the number of days incarcerated revealed an invalid PAI profile to be associated with only marginally greater likely of adjudication for a physically aggressive/violent infraction (*OR* = 1.22) or a verbally aggressive/defiant infraction (*OR* = 1.08) than a valid PAI. When considering adjudication for a nonaggressive/nonviolent infraction (*OR* = 1.02) or any infraction type (*OR* = 1.01), invalid PAI status did not increase the likelihood of adjudication after controlling for the number of days incarcerated.

Subjects Who Committed Violent Infractions

An independent samples *t*-test was calculated to test the hypothesis that individuals who committed at least one violent infraction would have higher rates of verbally aggressive/defiant infractions than would individuals who committed at least one infraction but who had not committed a physically aggressive/violent violation. A Levene's test of equality of variance suggested that the assumption of homogeneity of variance was violated (F = 409.449, p< .001). A variance ratio confirmed this conclusion (*variance ratio* = 5.44) and a more stringent alpha level of .01 was set before proceeding.

Significant differences were found in the yearly rates of verbally aggressive/defiant infractions (t[1413.45] = - 10.404, p < .001), such that individuals who committed at least one physically aggressive/violent infraction (M = 2.03, SD = 3.55) had significantly higher rates of verbally aggressive/defiant infractions than individuals who committed at least one infraction but had not committed a physically aggressive/violent violation (M = 0.97, SD = 1.522). A similar result was found when examining yearly rates of committing any infraction type (t[1439.80] = - 15.732 p < .001), with individuals who committed at least one physically aggressive/violent infraction (*M* = 3.89, *SD* = 4.18) displaying significantly higher rates than those who committed a least one infraction without a violent violation (*M* = 2.00, *SD* = 1.96). That is, when examining the yearly rates of infractions among inmates who had been adjudicated for at least one infraction during the study period, those inmates who committed an aggressive/violent infraction displayed significantly higher yearly rates of verbally aggressive/defiant infractions and higher yearly rates of any infraction type than inmates who had committed infractions other than aggressive/violent types.

This pattern did not hold constant when examining nonaggressive/nonviolent infraction types. Although a significant difference was found across groups (t[5869] = 3.21, p = .001), those individuals who committed at least one infraction without a physically aggressive/violent violation (*M* = 1.02, *SD* = 1.12) had significantly higher yearly rates of nonaggressive/nonviolent infractions than did those who committed at least one violent infraction (*M* = 0.93, SD = 1.07).

As can be seen in Table 26, the proportion of total infractions attributed to individuals who committed at least one physically aggressive/violent infraction further suggested that these individuals were responsible for many more infractions than would have been proportionally expected. For example, although inmates who were adjudicated for at least one physically aggressive/violent infraction made up just 7.5% of the sample, they were responsible for over 41% of all infractions and 43% of verbally aggressive/defiant infractions. Likewise, the base rate of other infraction types among these individuals suggested that those who committed at least one physically aggressive infraction were more likely than not to have committed other infraction types.

Table 26

Percentage of Infractions Attributed to Individuals who Committed at Least One Physically Aggressive/Violent Offense

Infraction Category	Base Rate %	Base Rate (*n*)	Percent of All Infractions
Physically Aggressive/Violent	----	----	100.0
Verbally Aggressive/Defiant	72.3	(926)	43.09
Nonaggressive/Nonviolent	63.4	(812)	25.56
Any Infraction	----	----	41.29

Note. Individuals who committed at least one physically aggressive/violent infractions made up 7.5% of the sample (*n* = 1,281).

PAI Scales

Interscale Relationships

A series of Pearson's correlation coefficients were calculated to examine the relationships among PAI scales. The intercorrelation matrix (presented in Table 27) revealed PAI scale associations to be generally similar to the patterns of relationships found among the community validation sample (Morey, 1991) and consistent with prior diagnostic theory and research. Although the strength of relationship varied somewhat across populations, the direction and pattern of association across scales were in the expected direction. With the exception of ICN and INF, when compared to the community validation sample, the current correlation values tended to be larger. According to Morey (1991), larger correlation values are likely due to greater variance in scale scores, which was consistent with the greater variance found among this sample of incarcerated offenders when compared to community norms.

Table 27
PAI Interscale Correlations

	ICN	INF	NIM	PIM	SOM	ANX	ARD	DEP	MAN	PAR	SCZ	BOR	ANT	ALC	DRG	AGG	SUI	STR	NON	RXR	DOM	WRM	VPI	SPI
ICN	----	.167	.149	-.078	.170	.180	.133	.225	-.012*	.244	.221	.165	.083	.068	.091	.163	.199	.107	.210	-.071	-.150	-.279	.096	.174
INF		----	.112	.110	.051	.104	.044	.089	-.007*	.152	.130	.040	.048	-.022	.049	.080	-.053	-.063	.140	.067	-.123	-.137	.039	.066
NIM			----	-.526	.657	.722	.709	.735	.391	.651	.794	.691	.411	.209	.291	.413	.630	.514	.557	-.436	-.235	-.380	.686	.765
PIM				----	-.429	-.656	-.610	-.617	-.461	-.541	-.601	-.799	-.576	-.338	-.472	-.566	-.405	-.612	-.427	.625	.159	.354	-.694	-.709
SOM					----	.684	.616	.685	.252	.499	.649	.548	.229	.182	.233	.303	.540	.421	.416	-.360	-.242	-.334	.465	.659
ANX						----	.802	.836	.329	.645	.792	.780	.353	.266	.348	.430	.593	.558	.517	-.546	-.388	-.453	.610	.828
ARD							----	.729	.452	.608	.727	.729	.339	.249	.316	.377	.548	.534	.471	-.544	-.234	-.338	.624	.768
DEP								----	.211	.673	.807	.789	.365	.251	.354	.419	.667	.619	.632	-.546	-..415	-.548	.619	.852
MAN									----	.420	.372	.469	.498	.141	.244	.422	.172	.309	.168	-.279	.324	.026	.568	.396
PAR										----	.729	.721	.492	.159	.329	.528	..479	.539	.644	-.363	-.187	-.523	.691	.718
SCZ											----	.756	.447	.243	.346	.465	.618	.554	.660	-.476	-.348	-.602	.705	.828
BOR												----	.629	.335	.533	.641	.554	.707	.601	-.676	-.226	-.459	.817	.874
ANT													----	.262	.526	.651	.267	.445	.377	-.398	.082	-.294	.767	.539
ALC														----	.362	.304	.193	.274	.174	-.346	-.100	-.182	.385	.380
DRG															----	.377	.221	.445	.325	-.506	-.072	-.196	.562	.513
AGG																----	.310	.407	.373	-.346	.092	-.413	.694	.553
SUI																	----	.397	.463	-.358	-.299	-.359	.475	.619
STR																		----	.569	-.568	-.178	-.323	.602	.692
NON																			----	-.350	-.274	-.555	.580	.671
RXR																				----	.211	.220	-.535	-.605
DOM																					----	.364	-.010*	-.287
WRM																						----	-.416	-.519
VPI																							----	.815
SPI																								----

Note. All correlations significant at $p < .001$, except those with an asterisk.
* $p > .05$.

Although a detailed description of all patterns of associations across scales is beyond the scope of this paper, a few noteworthy patterns warrant discussion. Consistent with the assumption that symptom endorsement is likely to increase with random/careless responding, scores on the ICN and INF scales were positively associated with scores on most clinical scales. The NIM and Positive Impression Management (PIM) scales had a moderate negative relationship with each other (r = -.57, p < .001), which was consistent with the contention that they measure opposite constructs. Scales intended to assess psychotic spectrum constructs (i.e., Schizophrenia [SCZ], Paranoia [PAR], and BOR) were highly related (r = .72-.76; p < .001). Moderate to strong correlations were found among scales associated with suicide risk (i.e., Depression [DEP], Suicidal Ideation, [SUI], and SPI). Likewise, AGG, ANT, and VPI, which have been hypothesized to be associated with increased risk for violence, displayed moderate to strong associations (r = .65-.77, p < .001).

PAI Descriptive Statistics

A series of descriptive statistics (see Table 28) were calculated to examine PAI scale fluctuations for the sample of newly incarcerated offenders relative to Morey's (1991) community validation sample. When mean scale scores were averaged across the 22 major PAI scales, an average scale elevation of 53.98 (SD = 12.60) was obtained, which placed the sample about a third of a standard deviation higher across major scales than Morey's norming sample (in which M = 50, SD = 10). Similar analyses for PAI subscales and coefficients revealed an analogous average scale elevation and dispersion (M = 53.64, SD = 12.39). When considering average score fluctuations across subjects on all PAI scales, subscales, and coefficients (i.e., VPI and SPI), scores displayed a variance

Table 28
PAI Major Scale and Coefficient Descriptive Statistics

Scale	*M*	*SD*	*SE*	Min	Max	Skewness [a]	Kurtosis [b]	% ≥ 70 *T* [c]
ICN	52.54	8.63	0.07	34	103	0.505	0.530	4.2
INF	55.39	9.82	0.08	40	110	0.537	0.184	9.2
NIM	53.45	13.65	0.10	44	144	2.127	5.165	12.7
PIM	50.07	11.61	0.09	15	77	- 0.389	- 0.204	3.2
SOM	50.89	11.03	0.08	39	107	1.599	2.610	7.9
ANX	52.20	12.97	0.10	34	103	1.148	1.064	10.8
ARD	52.03	13.19	0.10	26	108	0.885	0.500	11.1
DEP	55.36	13.46	0.10	35	111	0.933	0.536	15.7
MAN	50.70	10.79	0.08	25	100	0.995	0.447	5.9
PAR	55.40	12.71	0.10	29	112	0.683	0.582	13.2
SCZ	51.55	13.99	0.11	32	123	1.258	1.831	10.6
BOR	58.15	13.44	0.10	32	103	0.551	- 0.207	20.4
ANT	61.88	11.73	0.09	36	115	0.660	0.317	24.6
ALC	58.57	17.57	0.13	41	105	0.993	- 0.093	25.1
DRG	69.44	20.40	0.15	42	114	0.302	- 1.059	47.7
AGG	51.69	12.99	0.10	32	97	0.833	0.292	10.3
SUI	50.71	12.34	0.09	43	117	2.434	6.498	8.5
STR	61.41	12.46	0.10	37	91	0.347	- 0.549	26.2
NON	52.39	13.30	0.10	37	102	0.974	0.512	10.9
RXR	42.24	10.34	0.08	20	72	0.064	- 0.593	0.2
DOM	51.93	10.30	0.08	13	78	- 0.259	0.113	3.9
WRM	49.56	10.94	0.08	8	72	- 0.368	- 0.055	1.7
VPI	60.72	17.01	0.13	43	130	1.192	1.003	26.9
SPI	57.57	15.10	0.12	40	102	0.930	- 0.075	21.1

Note. *N* = 17,054
[a] *SE* = 0.019; [b] *SE* = 0.038; [c] Percent of subjects with clinically elevated scale score (70 *T or higher*).

about 25% greater than was found in the validation sample. Thus, the variability of psychopathology and personality traits measured by the PAI appeared to be greater among these incarcerated offenders when compared to the norming sample and, by extension, the general population.

PAI mean scale score and standard deviations varied depending on the trait under investigation. For example, given that the sample consisted of incarcerated offenders who had been convicted of serious crimes (i.e., antisocial behaviors), it was not surprising that mean ANT elevations (*M* = 61.88, *SD* = 11.73) were more than 1 standard deviation greater than those found in the community validation sample. Consistent with research that has demonstrated significantly higher rates of substance abuse/dependence among incarcerated populations when compared to community samples (Fazel et al., 2006; Lo & Stevens, 2000), mean PAI scale elevations for substance-related problem were 1 to 2 standard deviations greater than was found in the PAI community validation sample, with the Drug Problems (DRG) scale displaying the highest mean elevation among all scales (*M* = 69.44, *SD* = 20.40). Similarly, given that all subjects completed the PAI within days of having been placed into DOC custody and were facing a long-term incarceration, a mean Stress (STR) score of 61.41 (*SD* = 12.46) was not unexpected. Other scales that were more than one-half standard deviation greater than the PAI community validation sample included the following: BOR (*M* = 58.15, *SD* = 13.44), INF (*M* = 55.45, *SD* = 9.82), Paranoia (PAR; *M* = 55.40, *SD* = 12.71), and Depression (DEP; *M* = 55.36, *SD* = 13.46).

Among PAI scales that were within one-half standard deviation Morey's (1991) community validation sample, the most striking was the AGG scale (*M* = 51.69, *SD* =

12.99), which placed subjects' attitudes consistent with anger, hostility, and aggression in a similar range to that of the general population. The Treatment Rejection Scale (RXR), a measure of willingness to for mental health treatment, was the only scale that was more than one-half standard deviation lower than the community validation sample (*M* = 42.24, *SD* = 10.34). Thus, the subjects appeared to be more willing than the general population to seek/receive mental health treatment.

As can be further seen in Table 28, the percentage of subjects who scored in the clinically significant range (i.e., 70 *T* or higher) varied depending upon the scale under investigation. The greatest proportion of inmates scoring in the clinically elevated range was demonstrated for DRG. That is, the responses of 47.7% of subjects reflected drug-related difficulties that likely warranted a diagnosis of at least drug abuse (Morey, 2003). More than one-quarter of the subjects endorsed clinically significant levels of stress (STR) and negative consequences associated with alcohol (ALC). Almost 25% of subjects displayed clinically elevated levels of ANT, and VPI and SPI configurations placed over one-fifth of all subjects at clinically elevated risk for violence and suicide. The lowest proportion of subjects elevated above 2 standard deviations above the standardization sample was found for RXR (0.2%).

Subscale and coefficient analyses revealed a similar pattern of personality traits and psychopathology relative to Morey's community norms as the PAI major scales previously discussed (see Table 29). Consistent with expectations about an incarcerated population, response patterns on scales associated with a history of antisocial and criminal behaviors (ANT-A; *M* = 67.43, *SD* = 10.38) and potential for violence (SPI; *M* = 60.72, *SD* = 17.01) were the most elevated among subscales. The Negative Relationships

Table 29
PAI Subscale Descriptive Statistics

Scale	*M*	*SD*	*SE*	Min	Max	Skewness [a]	Kurtosis [b]
SOM-C	52.01	12.34	0.09	43	114	1.857	3.449
SOM-S	50.71	10.90	0.08	38	102	1.134	1.118
SOM-H	49.67	9.62	0.07	40	97	1.757	3.236
ANX-C	52.38	12.29	0.09	36	91	0.952	0.396
ANX-A	50.49	12.30	0.09	34	96	1.066	0.946
ANX-P	53.27	12.98	0.10	38	106	1.359	1.754
ARD-O	49.95	10.61	0.08	25	89	0.419	0.081
ARD-P	47.42	10.72	0.08	31	98	0.778	0.588
ARD-T	56.38	14.86	0.11	41	99	1.051	0.242
DEP-C	54.85	13.51	0.10	37	107	1.065	0.942
DEP-A	55.04	12.60	0.10	39	105	1.149	1.025
DEP-P	53.70	11.73	0.09	36	94	0.494	- 0.427
MAN-A	49.74	11.45	0.09	29	104	0.712	0.634
MAN-G	53.69	11.63	0.09	31	86	0.343	- 0.360
MAN-I	48.04	11.10	0.09	31	88	0.739	0.359
PAR-H	55.86	12.94	0.10	28	98	0.497	0.078
PAR-P	55.34	12.45	0.10	39	110	1.189	1.537
PAR-R	52.41	11.62	0.09	30	98	0.450	0.164
SCZ-P	48.60	12.07	0.09	36	117	1.730	4.031
SCZ-S	52.47	12.40	0.09	36	97	0.885	0.510
SCZ-T	51.82	13.89	0.11	37	108	1.284	1.396
BOR-A	51.33	12.17	0.09	36	91	0.962	0.431
BOR-I	57.02	12.68	0.10	36	89	0.498	- 0.511
BOR-N	58.99	12.33	0.09	34	91	0.229	- 0.500
BOR-S	59.43	14.35	0.11	37	107	0.629	- 0.053
ANT-A	67.43	10.38	0.08	39	93	- 0.177	- 0.245

Table 29 *(cont.)*

Scale	*M*	*SD*	*SE*	Min	Max	Skewness [a]	Kurtosis [b]
ANT-E	52.47	10.87	0.08	39	118	1.172	1.701
ANT-S	56.56	13.40	0.10	37	103	0.813	0.133
AGG-A	50.62	12.13	0.09	34	84	0.634	- 0.285
AGG-V	49.04	10.56	0.08	31	82	0.468	- 0.084
AGG-P	55.61	14.00	0.11	42	103	1.236	1.069

Note. N = 17,054
[a] *SE* = 0.019; [b] *SE* = 0.038.

(BOR-N; *M* = 58.99, *SD* = 12.33), Identity Problems (BOR-I; *M* = 57.02, *SD* = 12.68), Stimulus Seeking (ANT-S; *M* = 56.56, SD =13.40), Traumatic Stress (ARD-T; *M* = 56.38, *SD* =14.86), Hypervigilance (PAR-H; *M* = 55.86, *SD* = 12.94), Persecution (PAR-P; *M* = 55.34, *SD* = 12.45), and Depression-Affective subscales (DEP-A; *M* = 55.05, *SD* = 12.60) were elevated more than one-half standard deviation above the community validation sample. Although average Suicidal Ideation (SUI) elevations were similar to the normal population, Self-Harm (BOR-S; *M* = 59.43, *SD* = 14.35) and SPI elevations (*M* = 57.57, *SD* = 17.01) placed this sample of incarcerated offenders at greater risk for impulsivity associated with self-harming or suicidal behaviors than was found in the validation sample.

Gender

As can be seen in Table 30, descriptive statistics were calculated to identify and examine gender differences among mean PAI scale elevations. An independent samples *t*-test was run to determine if significant differences existed between male and female subjects' NIM scores. Before the computing the *t*-test, a Levene's Test was calculated to

Table 30
Gender Differences Among PAI Scales

Scale	Males [a] *M*	Males [a] *SD*	Females [b] *M*	Females [b] *SD*	Absolute Mean Difference	*t* [c]	*d* [d]
ICN	52.56	8.68	52.37	8.18	0.19	0.93	.02
INF	55.47	9.87	54.80	9.72	0.67	2.86**	.07
NIM	53.16	13.51	55.69	14.44	2.53	- 7.79***	- .18
PIM	50.47	11.54	47.04	11.72	3.43	12.44***	.29
SOM	50.50	10.90	53.80	11.59	3.30	- 12.61***	- .29
ANX	51.54	12.59	57.17	14.66	5.63	- 18.37***	- .41
ARD	51.26	12.79	57.85	14.64	6.59	- 21.21***	- .47
DEP	54.69	13.19	60.40	14.34	5.71	- 17.95***	- .40
MAN	50.73	10.82	50.43	10.51	0.30	1.16	.03
PAR	55.17	12.71	57.07	12.61	1.90	- 6.27***	- .15
SCZ	51.18	13.89	54.34	14.37	3.16	- 9.49***	- .22
BOR	57.51	13.28	62.94	13.71	5.43	- 17.07***	- .38
ANT	61.96	11.71	61.25	11.88	0.71	2.52*	.06
ALC	58.79	17.50	56.92	17.99	1.87	4.46***	.10
DRG	68.41	19.83	77.19	19.93	8.78	- 18.55***	- .44
AGG	51.63	12.90	52.17	13.58	0.54	- 1.74	- .04
SUI	50.50	12.29	52.25	12.64	1.75	- 5.39***	- .14
STR	60.88	12.41	65.48	12.11	4.60	- 15.60***	- .38
NON	52.14	13.18	54.26	14.01	2.12	- 6.69***	- .16
RXR	42.69	10.34	38.81	9.67	3.90	15.85***	.39
DOM	52.06	10.13	50.90	11.49	1.16	4.72***	.10
WRM	49.52	10.88	49.87	11.36	0.35	- 1.34	- .03

Note. N = 17,054
[a] n = 15,065; [b] n = 1,989; [c] df = 17052. [d] Cohen (1988) proposed the following system for classifying d scores: Small = .20-.49, Medium = .50-.79, Large $\geq$ .80.
* $p < .05$; ** $p < .01$; *** $p < .001$.

assess for homogeneity of variance between groups. Although the Levene's test was significant ($F = 20.77$, $p < .005$), a variance ratio revealed this to be due to the influence of a very large sample size, rather than a violation of the assumption of equal variances (*variance ratio* = 1.14). Significant differences were found between male and female mean NIM scores ($t[17052] = -7.79$, $p < .001$), such that female subjects ($M = 55.69$, $SD = 14.44$) presented themselves in a more negative light than did male subjects ($M = 53.16$, $SD = 13.51$). Similar analyses were undertaken for each PAI scale, resulting in significant mean score differences between male and female subjects on all but four scales (i.e., ICN, MAN, AGG, and WRM). As with NIM, variance ratios showed all significant Levene's tests to be due to sample size rather than unequal variances between groups.

Females had significantly higher mean scale scores than men on two-thirds of those scales found to be significantly different. Consistent with greater NIM elevations, female subjects displayed significantly higher scores on scales associated with somatic, anxious, depressive, and psychotic symptomatology. The greatest difference was found on ARD ($d = -.47$), DRG ($d = -.44$), DEP ($d = -.41$), ANX ($d = -.41$), and STR ($d = -.38$), with female subjects endorsing higher levels of depressive- and anxiety-spectrum symptomatology, stress, and negative consequences associated with drug abuse than did male subjects. Although females scored significantly higher than males on the majority of scales, examination of mean score differences and overall effect size demonstrated many differences to be relative small. For example, although females ($M = 52.25$, SD = 12.64) displayed greater SUI elevations than males ($M = 50.50$, $SD = 12.29$; $t[17054] = -5.39$, p

< .001), a 1.75 *T*-score difference (*d* = - .14 [i.e., less than one-sixth standard deviation]) suggested little practical difference.

Consistent with the finding that males (*M* = 53.76, *SD* = 12.50) had a lower average scale elevation across PAI major scales than females (*M* = 55.59, *SD* = 12.96), significant differences were found in the endorsement of items that presented respondents in a favorable light (i.e., PIM; *t*[17054] = 3.43, *p* < .001). Although relatively small in magnitude (*d* = .29), male subjects demonstrated higher PIM scores (*M* = 50.47, *SD* = 11.54) when compared to female subjects (*M* = 47.04, *SD* = 11.72). Despite scoring significantly higher than females (*M* = 38.81, *SD* = 9.67) on Treatment Rejection (RXR; *t*[17054] = 15.85, *p* < .05; *d* = .39), male subjects' level of interest in psychological and emotional change (*M* = 42.69, *SD* = 10.34) remained much greater than community norms (*d* = .72). Compared to females, males displayed significantly higher scores on ANT (*t*[17052] = 2.528, *p* < .05), ALC (*t*[17052] = 4.46, *p* <.001), and DOM (*t*[17,052] = 4.72, *p* < .001); however, mean score differences were minimal (*d* = .06-.10). Coupled with the fact that significant differences between males and females were not found on AGG, the hypothesis that male inmates harbor more antisocial and aggressive personality traits than female inmates was not be supported by these data.

Profile Validity

As previously noted, 2,383 subjects completed invalid PAI profiles (i.e., scores higher than the validity cutoffs set by Morey [1991] on one or more of the four main validity scales [see Method section]). This group displayed greater mean scale elevations and dispersion across the 22 major scales (*M* = 56.16, *SD* = 12.30; *d* = .24) when compared to the 14,671 subjects whose PAI profiles were considered interpretable (*M* = 53.24, *SD* = 11.71).

To verify that significant differences in validity scale elevations existed between subjects who completed invalid profiles and those who completed valid profiles, an independent samples *t*-test was run for each validity index. Before computing the *t*-test, a series of Levene's tests and variance ratios were computed which indicated that the assumption of equal variances was violated in each case, thus requiring the adoption of a more stringent alpha level to reduce the likelihood of a Type I error ($p < .01$). Significant differences in validity scale elevations were found for each of the four validity indexes ($p < .001$), with subjects whose profiles were invalid displaying significantly higher scale scores than did those with valid profiles (see Table 31). Consistent with this pattern, individuals who completed invalid PAIs also demonstrated significantly higher scale elevations for most scales than did those who completed valid profiles ($p < .001$; $d = .19$-.85); however, significant differences were not found between groups on MAN, BOR, and AGG. Invalid profiles were associated with significantly lower ANT, ALC, DRG, STR, and DOM scores ($p < .001$; $d = .03$-.42).

Although comparison of PAI scale fluctuations according to overall profile validity allowed for discussion of scale patterns associated with general invalid responding, this strategy did not discriminate among the various types of validity rule violations. That is, scale elevations may have varied depending on whether an invalid profile resulted from random/idiosyncratic responding or intentional attempts to portray oneself in a particular light. Although a detailed scale-by-scale analysis comparing each invalid response style was beyond the scope of this study, examinations of average scale

Table 31

PAI Scale Differences Among Valid and Invalid Profiles

Scale	Valid [a] *M*	Valid [a] *SD*	Invalid [b] *M*	Invalid [b] *SD*	Mean Difference	*t*	*df* [c]	*d*
ICN	51.98	7.66	55.99	12.54	4.01	- 15.15***	2677.26	- .39
INF	54.08	8.52	63.47	13.13	9.39	- 33.78***	2716.74	- .85
NIM	51.98	10.30	62.53	24.15	10.55	- 21.02***	2524.52	- .57
PIM	49.31	10.48	54.76	16.24	5.46	- 15.88***	2713.11	- .40
SOM	50.27	10.13	54.68	14.89	4.41	- 13.94***	2751.50	- .35
ANX	51.71	11.90	55.22	17.95	3.51	- 9.22***	2732.08	- .23
ARD	51.63	12.20	54.50	17.97	2.87	- 7.53***	2749.51	- .19
DEP	54.89	12.33	58.27	18.73	3.39	- 8.53***	2726.84	- .21
MAN	50.75	10.39	50.35	12.94	0.40	1.68	17,052	.03
PAR	54.95	11.70	58.14	17.44	3.20	- 8.64***	2740.84	- .21
SCZ	50.67	12.12	56.95	21.49	6.27	- 13.89***	2633.41	- .36
BOR	58.23	12.44	57.61	18.45	0.62	1.58	2744.55	.04
ANT	62.07	11.31	61.68	14.03	1.40	5.40***	17,052	.03
ALC	58.81	17.66	57.12	16.91	1.68	4.34***	17,052	.10
DRG	69.95	20.10	66.31	19.39	3.63	8.22***	17,052	.42
AGG	51.73	12.53	51.45	15.49	0.28	0.96	17,052	.02
SUI	49.84	10.93	56.06	17.91	6.22	- 16.46***	2677.37	- .42
STR	61.79	11.97	59.11	14.94	2.68	9.76***	17,052	.20
NON	51.89	12.58	55.43	16.75	3.53	- 12.08***	17,052	- .24
RXR	41.79	9.91	44.96	12.30	3.17	- 13.96***	17,052	- .28
DOM	52.15	10.06	50.57	11.58	1.58	6.93***	17,052	.15
WRM	49.75	10.50	49.39	13.30	1.37	5.66***	17,052	.03

Note. N = 17,054

[a] n = 14,671; [b] n = 2,383; [c] *df* < 17052 signifies that the assumption of homogeneity of variance was violated and a more stringent alpha level was adopted ($p < .01$)

*** $p < .001$.

elevations across response styles supported the PAI validity scales. Consistent with symptom exaggeration and/or an unfavorable self-portrayal, the mean scale elevation for subjects with invalid NIM scores (n = 526) was much higher than those found among other groups (M = 69.17, SD = 13.11). Conversely, PIM scores that were higher than was acceptable (n = 963) were associated with a lower than average mean scale elevation (M = 47.90, SD = 7.41). Finally, moderate mean scale elevations were found among subjects with ICN (n = 400, M = 58.00, SD = 12.79) and INF (n = 791, M = 57.33, SD = 12.80) scores that suggested an invalid profile.

Although 86% of the sample completed valid PAIs, significant intragroup differences were found when examining validity rates according to demographic and institutional variables ($p < .01$). A significant difference was found in the validity rates across ethnic groups ($x^2[4] = 142.85$, $p < .001$), with White subjects displaying the highest rate of valid profiles (87.4%), followed by Black (80.4%), Native American (79.5%), Hispanic (76.4%), and Asian subjects (75.2%). A *Cramer's V* was calculated to estimate the degree of association between ethnicity and validity rate, which revealed a small but significant association ($\Phi_c = .092$). As can be seen in Table 32, significant differences in validity rate were also found for gender, index offense, gang affiliation, and violent infractions. Similar to ethnicity, which demonstrated the strongest effect across these variables, small associations with validity rate were demonstrated.

Individuals Who Committed Violent Institutional Infractions

Subjects who were found guilty of committing a violent institutional infraction during the study period displayed a slightly higher mean scale elevation across the 22 major PAI scales (n = 1,281; M = 54.75, SD = 12.70) than subjects who were not

Table 32
Validity Rates According to Gender, Ethnicity, Index Offense, Gang Affiliation, and Violent Institutional Behaviors

Group	Valid		Invalid				
	%	(*n*)	%	(*n*)	X^2	*df*	Φ_c
Gender					9.136**	1	.023
Males	85.7	12,916	14.3	2,149			
Females	88.2	1,755	11.8	234			
Ethnicity					142.845***	4	.092
White	87.4	12,548	12.6	1,816			
Black	80.4	1,185	19.6	289			
Hispanic	76.4	554	23.6	171			
Native American	79.5	267	20.5	69			
Asian	75.2	115	24.8	38			
Index Offense					21.959***	2	.036
Person	84.7	6,525	15.3	1,179			
Property	86.9	4,303	13.1	646			
Statutory	87.4	3,380	12.6	515			
Gang Affiliation					11.328**	1	.026
Affiliated	86.3	13,378	13.7	212			
Non-Affiliated	83.2	1,293	16.8	261			
Violent Infraction					7.191**	1	.007
No	86.2	13,601	13.8	2,172			
Yes	83.5	1,070	16.5	211			

Note. N = 17,054.
** $p < .01$; *** $p < .001$

adjudicated for a violent infraction (n = 15,773, M = 53.92, SD = 12.62). Examination of intergroup PAI scale score differences revealed the two groups differed by a small margin (*M difference* = 1.34; d = .07). Thus, when considering the PAI as a whole, the level of psychopathology among individuals who committed violent infractions was similar to the levels found among subjects who did not commit infractions. However, examination of individual PAI scale fluctuations revealed significant differences between groups on several scales, many of which were designed to inform violence risk assessment.

A series of independent samples *t*-tests were run to determine whether significant interscale differences existed between individuals who had been adjudicated for least one violent infraction during incarceration and those who had not been adjudicated for a violent institutional infraction. As with previous analyses, estimates of the homogeneity of variance were computed before the t statistics were analyzed. Levene's tests ($p < .05$) and variance ratios ($\leq$ 1:2) confirmed that the assumption of equal variances had not been violated for any of the examined scales.

As can be seen in Table 33, significantly higher scale elevations were found for AGG (t[17052] = - 13.11, $p < .001$), ANT (t[17052] = - 12.23 , $p < .001$), and VPI (t[17052] = - 7.94, $p < .001$) scores, with subjects who committed a violent infraction scoring higher than those who did not commit a violent infraction. Consistent with hypothesized relationships with antisocial/violent behaviors, these three scales displayed the greatest mean score differences and effect sizes among all PAI scales when comparing inmates who were adjudicated for a violent infraction and for violent infractions and inmates who were not adjudicated for a violent infraction, with AGG

Table 33
PAI Scale Differences Among Subjects Who Committed Violent Infractions and Subjects Who Did Not Commit a Violent Infraction

	Violent Infraction During Incarceration						
	No [a]		Yes [b]		Absolute		
Scale	*M*	*SD*	*M*	*SD*	Mean Difference	*t* [c]	*d*
ICN	52.46	8.60	53.50	8.86	1.04	- 4.17***	- .12
INF	55.22	9.76	57.47	10.67	2.25	- 7.86***	- .22
NIM	53.39	13.56	54.20	14.59	0.81	- 2.03*	- .06
PIM	50.13	11.59	49.28	11.84	0.85	2.51*	.07
SOM	50.96	11.09	50.01	10.27	0.94	2.94**	.09
ANX	52.22	13.01	51.92	12.47	0.30	0.79	.02
ARD	52.05	13.91	51.74	13.22	0.31	0.81	.02
DEP	55.42	13.49	54.66	13.07	0.76	1.94	.06
MAN	50.53	10.74	52.81	11.09	2.28	- 7.29***	- .21
PAR	55.23	12.67	57.54	13.04	2.25	- 6.09***	- .18
SCZ	51.52	13.96	51.97	14.36	0.45	- 1.11	- .03
BOR	58.04	13.42	59.45	13.62	1.42	- 3.58***	- .10
ANT	61.57	11.64	65.72	12.21	4.15	- 12.23***	- .35
ALC	58.65	17.64	57.65	16.63	1.00	1.95	.06
DRG	69.38	20.07	70.15	19.69	0.77	- 1.32	- .04
AGG	51.32	12.83	56.24	14.01	4.92	- 13.11***	- .37
SUI	50.74	12.38	50.27	11.90	0.48	1.33	.04
STR	61.41	12.45	61.46	12.61	0.05	- 0.13	.00
NON	52.28	13.25	53.77	13.86	1.49	- 3.85***	- .11
RXR	42.22	10.34	42.46	10.23	0.24	- 0.80	- .02
DOM	51.79	10.32	53.57	10.02	1.78	- 5.94***	- .18
WRM	49.64	10.92	48.62	11.19	1.01	3.19**	.09
VPI	60.42	16.88	64.34	18.15	3.92	- 7.94***	- .22

[a] $n = 15{,}773$; [b] $n = 1{,}281$; [c] $df = 17052$; * $p < .05$; ** $p < .01$; *** $p < .001$.

elevations demonstrating the greatest difference between groups (*M Difference* = 4.92; d = .37). Similar magnitude effect sizes were noted among the INF and MAN scales, with adjudicated individuals demonstrating significantly greater elevations than those with no adjudicated violent infractions.

Although the magnitude of group difference varied across scales, individuals who committed violent infractions displayed significantly higher elevations on several additional scales, including NIM (t[17052] = - 2.03, $p < .05$; d =), PAR (t[17052] = - 6.09, $p < .001$), BOR (t[17052] = - 3.58, $p < .001$), and DOM (t[17052] = - 5.94, $p < .001$); however, the magnitudes of effect were minimal in each case (d = .06-.18). Subjects who did not commit a violent infraction were found to have significantly higher PIM (t[17052] = 2.51, $p < .05$, SOM (t[17052] = 2.94, $p < .01$) and WRM elevations (t[17052] = 3.19, $p < .01$) than did those who committed at least one infraction, though effect sizes were similarly small (d = .07-.09). Significant differences were not found between groups on nine scales, including SCZ (t[17052] = - 1.11, p = .267), DEP (t[17052] = 1.94, p = .053), STR (t[17052] = - 0.30, p = .896), and RXR (t[17052] = - 0.80, p = .421). Thus, although the mean elevation across scales suggested few group differences, examination of individual scales revealed important differences that supported the construct validity of those scales that were designed to assess factors associated with aggressive/antisocial behaviors.

PAI Scale and Demographic Variables in the Prediction of Institutional Misconduct

Association Between PAI Scales and Institutional Infractions

In order to investigate the relationship between the PAI and yearly rates of institutional infractions, a series of Pearson’s correlation coefficients were calculated.

Only those scales, subscales, and coefficients hypothesized a priori to be correlates of problematic institutional behaviors were included in the analyses. As noted earlier, all subjects were included when examining PAI validity scales (N = 17,054); however, only those subjects who completed valid PAI profiles were included in the analysis of other PAI scales (N = 14,671). As can be seen in Table 34, several scales displayed significant relationships with each infraction category. Although the strength and direction of association varied depending upon the scale under investigations, with the exception of SCZ all scales were significantly correlated with yearly infraction rates of any violation. ALC, DRG, and RXR were not significantly related to the yearly rate of physically aggressive/violent infractions or the yearly rate of verbally aggressive/defiant violations.

ANT and AGG displayed the strongest relationships with institutional infractions among the investigated PAI scales. Both scales were significantly correlated with the yearly rate of each infraction category, with each scale demonstrating an equivalent association with the yearly rate of physically aggressive/violent infractions (r = .11, p < .001). Of additional note, the association between these scales and physically aggressive/violent infractions was stronger than that found for VPI and physically aggressive/violent infractions (r = .08, p < .001). The relationship between ANT and the yearly rate of any infraction represented the strongest single association across PAI scales and infraction types (r = .14; p < .001).

Although statistically significant, the strength of association across scales appeared to be small; however, because the magnitude of these correlations is heavily dependent upon base rate, the true strength of relationship is likely to be greater than those in found in Table 34 (Nunnally & Berstein, 1994). Closer examination of the

Table 34
Correlations Between PAI Scales and Yearly Rate of Institutional Infractions

Scale	Infraction Type			
	Any	PA	VA	NA
ICN [a]	.06***	.05***	.05***	.05***
INF [a]	.05***	.04***	.05***	.01
NIM [a]	.03***	.03***	.05***	- .02**
PIM [a]	- .02**	- .03**	- .03**	.01
MAN [b]	.08***	.07***	.08***	.05***
PAR [b]	.06***	.05***	.07***	.02**
SCZ [b]	.01	.01	.03**	- .03**
BOR [b]	.03***	.03***	.04***	.00
ANT [b]	.14***	.11***	.11***	.10***
ALC [b]	- .03**	- .01	- .01	- .05***
DRG [b]	.02*	.02	.01	.03**
AGG [b]	.10***	.11***	.10***	.05***
RXR [b]	.02**	.01	.01	.03***
DOM [b]	.06***	.05***	.04***	.05***
VPI [b]	.08***	.08***	08***	.03***

Note. PA = Physically Aggressive/Violent; VA = Verbally Aggressive/Defiant; NA = Nonaggressive/Nonviolent.
[a] N = 17,054; [b] N = 14,671.
* p < .05; ** p < .01; *** p < .001.

relationship between age and overall infraction rate highlighted this statistical phenomenon. Although consistently found to be one of the strongest single predictors of institutional infractions across empirical investigations, the relationship demonstrated between age and overall yearly infraction rates ($r = -.16$, $p < .001$) was of similar magnitude to the association found for ANT. Statistical analyses that minimized the effect of a low base rate were undertaken and will be described in a further section.

A comparable pattern was found among the relationships between PAI subscales and infraction rates as was described for PAI major scales. As can be seen in Table 35, ANT and AGG subscales displayed the strongest associations with yearly rates of physically aggressive/violent, verbally aggressive/defiant, and overall infraction rates across investigated subscales ($r = .08$ -.13, $p < .001$), with the relationship between ANT-A and overall infraction rate demonstrating the strongest single association among subscales ($r = .13$, $p < .001$). As with major scales, the strength of association tended to be weaker across subscales for nonaggressive/nonviolent infractions than for other infraction types. With the exception of PAR-H, subscale associations with the yearly rates of physically aggressive/violent infractions, verbally aggressive/defiant infractions, and any infraction type were not found to be greater than those found among their corresponding major scale. However, five subscales displayed greater correlations with nonaggressive/nonviolent infractions than with their corresponding major scale (PAR-H, BOR-S, BOR-I, ANT-A, and AGG-V). However, the magnitude of difference was unremarkable, demonstrating an increase of only $r = .01$-.02. Because the majority of subscales did not display greater associations with the yearly rates of infractions across categories than their corresponding major scale, and because the difference in magnitude

Table 35

Correlations Between PAI Subscales and Yearly Rate of Institutional Infraction

	Infraction Type			
Scale	Any	PA	VA	NA
MAN-A	.05***	.04***	.05***	.03**
MAN-G	.07***	.06***	.05***	.05***
MAN-I	.07***	.06***	.06***	.03***
PAR-H	.07***	.06***	.07***	.03***
PAR-P	.06***	.05***	.07***	.01
PAR-R	.03***	.02**	.03***	.02
BOR-A	.04***	.05***	.05***	- .01
BOR-I	.01	.01	.02*	- .02*
BOR-N	.02*	.02*	.03**	.00
BOR-S	.05***	.04***	.04***	.03***
ANT-A	.13***	.11***	.10***	.11***
ANT-E	.10***	.08***	.09***	.07***
ANT-S	.11***	.09***	.09***	.08***
AGG-A	.08***	.09***	.08***	.02*
AGG-V	.10***	.09***	.08***	.06***
AGG-P	.10***	.11***	.09***	.04***

Note. N = 17,054; PA = Physically Aggressive/Violent; VA = Verbally Aggressive/Defiant; NA = Nonaggressive/Nonviolent.
* $p < .05$; ** $p < .01$; *** $p < .001$.

when found was minimal, subscale analyses did not appear to add practical incremental validity over major scales to warrant further analysis.

Predictive Validity of Individual PAI Scales

A series of hierarchical binary logistic regressions were calculated to determine the predictive validity of individual PAI scales for the prediction of adjudication for each category of institutional misconduct after controlling for time and several demographic variables. Analyses were first calculated controlling only for time incarcerated in order to account for the fact that each subject had a different period of risk (i.e., opportunity to obtain an institutional infraction). A second series of analyses that further controlled for several demographic variables were calculated to examine the impact of these variables on the predictive utility of each PAI scale. To further assess the practical significance of clinically elevated scores and to aid in the interpretation of significant *b* weights, the odds of committing an infraction were calculated for subjects with clinically elevated scale scores (i.e., *t* score of 70 or greater; Morey, 2003) when compared to subjects with nonclinically elevated scale scores. As will be demonstrated, ANT elevations were the strongest individual predictor across scales for each category of institutional infraction after controlling for the amount of time incarcerated; however, adding statistical controls for demographic variables resulted in other scales entering the picture as the strongest individual predictors of institutional violations.

Predictive Validity After Controlling for Time Incarcerated

Any infraction. A hierarchical binary logistic regression was computed to determine if ANT significantly predicted whether or not an inmate was adjudicated for any type of institutional infraction during the study period after controlling for the amount of time served. Institutional violations were regressed in two steps. The number of days incarcerated was entered in the first step to determine the amount of variance for which it accounted. ANT was entered in the second step to determine if it added any variance to the prediction equation. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 14,671] = 131.32, $p < .001$). Likewise, the final model with ANT entered into the equation was a significant predictor of whether or not an individual committed any type of infraction (X^2 [2, N = 14,671] = 279.09, $p < .001$). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor of institutional violations (b = .019, *Wald* = 147.31, $p < .001$) such that, as ANT scores increased, the likelihood that an individual had been adjudicated for any institutional violation increased. Inmates scoring above the clinical range on ANT were 1.36 times more likely to have committed an infraction than inmates scoring below the clinical range on ANT.

As can be seen in Table 36, with the exception of BOR (b = - .001, *Wald* = 0.282, p = .596) and DRG (B = .001, *Wald* = 0.379, p = .560), each individual PAI scale under investigation was a significant predictor of adjudication for any infraction after controlling for the amount of time served; however, as with the relative associations between scales and infraction rates, the strength and direction of significant predictors varied depending on the scale under investigation. ANT, DOM (b = .014, *Wald* = 65.70, $p < .001$) and MAN (b = .011, *Wald* = 46.16, $p < .001$), were the strongest positive predictors across scales, such that higher scores were associated with a greater likelihood of committing an institutional infraction. Individuals with clinically elevated DOM and

Table 36

Predictive Validity of PAI Scales in the Prediction of Adjudication For Any Institutional Infraction After Controlling for Time Served

Scale	*b*	*Wald*	Odds Ratio Associated with Clinical Elevation
ICN [a]	.004	5.27*	1.14
INF [a]	.008	25.58***	1.20
NIM [a]	- .006	21.72***	0.87
PIM [a]	.004	7.17**	0.93
MAN [b]	.011	46.16***	1.30
PAR [b]	.003	5.02*	1.03
SCZ [b]	- .005	11.76**	0.89
BOR [b]	- .001	0.28	0.98 (NS)
ANT [b]	.019	147.31***	1.36
ALC [b]	- .003	11.82**	0.88
DRG [b]	.001	0.34	1.02 (NS)
AGG [b]	.009	46.04***	1.23
RXR [b]	.009	26.72***	0.64 (NS)
DOM [b]	.014	65.70***	1.36
VPI [b]	.004	11.41***	1.11

Note. Clinical scale elevation = t score of 70 or higher. NS = $p > .05$.
[a] N = 17,054; [b] N = 14,671.
* $p < .05$; ** $p < .01$; *** $p < .001$.

MAN scores were 1.36 and 1.30 times more likely to have committed any infraction type than those scoring below the clinical range on these scales. NIM (b = - .006, *Wald* = 21.74, $p < .001$) and SCZ (b = - .005, *Wald* = 11.76, $p = .001$) were significant negative predictors of adjudication for any infraction, such that higher scores were associated with a lower likelihood of committing an infraction.

Physically aggressive/violent infractions. A hierarchical binary logistic regression was computed to determine if ANT significantly predicted adjudication for a physically aggressive/violent institutional infraction after controlling for the amount of time served. Physically aggressive/violent infractions were regressed in two steps. The number of days incarcerated was entered in the first step and ANT was entered in the second step to determine if it added any variance to the prediction equation. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual was adjudicated for a physically aggressive/violent infraction (X^2 [1, N = 14,671] = 13.11, $p < .001$). Likewise, the final model with ANT entered into the equation was a significant predictor of adjudication for a physically aggressive/violent infraction (X^2 [2, N = 14,671] = 169.93, $p < .001$). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor (b = .033, *Wald* = 163.03, $p < .001$), such that as ANT scores increased, the likelihood that an individual was adjudicated for a physically aggressive/violent institutional violation increased. Inmates scoring above the clinical range on ANT were 1.95 times more likely to have committed a physically aggressive infraction than inmates scoring below the clinical range.

Similar regression analyses revealed 11 of the 15 PAI scales under investigation to be significant predictors of whether or not an individual was adjudicated for a physically aggressive/violent infraction after controlling for the number of days incarcerated; however, similar to the results found for the likelihood of adjudication for any infraction, the strength and direction of each predictor varied according to the scale under investigation (see Table 37). Although NIM (b = .004, *Wald* = 3.615, p = .057) and SCZ (b = .000, *Wald* = 0.022, p = .883) were significant negative predictors of any infraction type, neither scale were significant predictors of physically aggressive/violent infractions after controlling for the amount of time served. Likewise, neither ALC (b = -.003, *Wald* = 1.977, p = .160) nor RXR (b = .002, *Wald* = 0.534, p = .465) were significant predictors. ANT and AGG (b = .028, *Wald* = 145.42, p < .001) were the strongest predictors of physically aggressive/violent infractions across scales, with the odds of adjudication for a violent infraction being 2.09 times greater for individuals with clinically elevated AGG scores when compared to individuals with AGG scores below the clinical cutoff; the odds were 1.95 for ANT. Despite a nonsignificant finding as a predictor of any infraction type, BOR was a significant positive predictor of whether or not an inmate committed a physically aggressive/violent infraction (b = .008, *Wald* = 11.39, p = .001). Of additional note, five scales (ANT, AGG, MAN, INF, and DOM) were more predictive of physically aggressive/violent violations than VPI (b = .015, *Wald* = 69.07, p < .001), which was designed specifically to assess factors associated with risk for violence (Morey, 2003).

Verbally aggressive/defiant infractions. A hierarchical binary logistic regression was computed to determine if ANT significantly predicted whether or not an inmate

Table 37
Predictive Validity of PAI Scales in the Prediction of Adjudication for a Physically Aggressive/Violent Institutional Infraction After Controlling for Time Served

Scale	*b*	*Wald*	Odds Ratio Associated with Clinical Elevation
ICN [a]	.014	16.99***	1.25 (NS)
INF [a]	.022	61.84***	1.74
NIM [a]	.004	3.62	1.23 [c]
PIM [a]	- .006	6.68*	0.87 (NS)
MAN [b]	.023	64.31***	1.52
PAR [b]	.013	23.71***	1.30
SCZ [b]	.000	0.22	1.16 (NS)
BOR [b]	.008	11.39*	1.24
ANT [b]	.033	163.03***	1.95
ALC [b]	- .003	1.98	0.91 (NS)
DRG [b]	.004	5.04*	1.10 (NS)
AGG [b]	.028	145.42***	2.09
RXR [b]	.002	0.53	0.87 (NS)
DOM [b]	.022	44.42***	1.65
VPI [b]	.015	69.07***	1.56

Note. Clinical scale elevation = t score of 70 or higher. NS = $p > .05$.
[a] N = 17,054; [b] N = 14,671; [c] Although NIM was not a significant predictor, a NIM t score of 70 or higher was significantly predictive of physically aggressive/violent infractions ($b = .205$, $Wald = 6.28$, $p = .012$).
* $p < .05$; ** $p < .01$; *** $p < .001$.

committed a verbally aggressive/defiant institutional infraction after controlling for the amount of time served. Verbally aggressive/defiant infractions were regressed in two steps. The number of days incarcerated was entered in the first step and ANT was entered in the second step to determine if it added any variance to the prediction equation. The regression equation in the first step with only the control variable entered (number of days incarcerated) was a significant predictor of whether or not an individual had been adjudicated for a verbally aggressive/defiant infraction (X^2 [1, N = 14,671] = 9.629, p = .002). Likewise, the final model with ANT entered into the equation was a significant predictor of adjudication for a verbally aggressive/violent infraction (X^2 [2, N = 14,671] = 196.74, $p < .001$). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor of institutional violations (b = .024, *Wald* = 188.57, $p < .001$) and to have the largest odds ratio, such that as ANT scores increased, the likelihood that an individual was adjudicated for a verbally aggressive/defiant institutional violation increased. Inmates scoring above the clinical range on ANT were 1.56 times more likely to have committed a verbally aggressive/defiant infraction than inmates scoring below the clinical range.

As can be seen in Table 38, additional regression analyses demonstrated 10 PAI scales to be significant predictors of adjudication for a verbally aggressive/defiant infraction, with ANT and MAN (b = .018, *Wald* = 92.45, $p < .001$) representing the strongest individual predictors across PAI scales. Clinically elevated MAN and DOM (b = .015, *Wald* = 52.16, $p < .001$) scores were associated with a 1.50 greater likelihood of committing a verbally aggressive/defiant infraction than nonclinically elevated scores. Scales assessing impression management (i.e., NIM [b = .000, *Wald* = 0.04, p = .836] and

Table 38

Predictive Validity of PAI Scales in the Prediction of Adjudication for a Verbally Aggressive/Defiant Institutional Infraction After Controlling for Time Served

Scale	*b*	*Wald*	Odds Ratio Associated with Clinical Elevation
ICN [a]	.009	17.02***	1.29
INF [a]	.011	36.98***	1.24
NIM [a]	.000	0.04	1.10 (NS)
PIM [a]	.000	0.00	1.05 (NS)
MAN [b]	.018	92.45***	1.50
PAR [b]	.010	39.20***	1.26
SCZ [b]	.001	0.54	1.07 (NS)
BOR [b]	.005	8.18**	1.14
ANT [b]	.024	188.57***	1.56
ALC [b]	- .002	3.07	0.93 (NS)
DRG [b]	.001	0.37	1.10 (NS)
AGG [b]	.014	83.58***	1.45
RXR [b]	.007	11.00**	0.62 (NS)
DOM [b]	.015	52.16***	1.50
VPI [b]	.009	50.53***	1.29

Note. Clinical scale elevation = *t* score of 70 or higher. NS = $p > .05$.
[a] $N = 17{,}054$; [b] $N = 14{,}671$.
* $p < .05$; ** $p < .01$; *** $p < .001$.

PIM [*b* = .000, *Wald* = 0.00, *p* = .956]) substance abuse (i.e., ALC [*b* = - .002, *Wald* = .3.07, *p* = .080] and DRG [*b* = .001, *Wald* = 0.37, *p* = .541]) were not significant predictors of adjudication for a verbally aggressive/defiant violation. Likewise, SCZ was not a significant predictor of adjudication for a verbally aggressive/defiant infraction (*b* = .001, *Wald* = 0.54, *p* = .464).

Nonaggressive/nonviolent infractions. A hierarchical binary logistic regression was computed to determine if ANT significantly predicted whether or not an inmate had been adjudicated for a nonaggressive/nonviolent institutional infraction during the study period after controlling for the amount of time served. As were the other infractions, onaggressive/nonviolent infractions were regressed in two steps. The regression equation in the first step with only the control variable (number of days incarcerated) entered was a significant predictor of whether or not an individual had been adjudicated for a nonaggressive/nonviolent infraction (X^2 [1, *N* = 14,671] = 33.69, $p < .001$). Likewise, the final model with ANT entered into the equation was a significant predictor of adjudication for a nonaggressive/nonviolent infraction (X^2 [2, *N* = 14,671] = 142.41, $p < .001$). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor of nonaggressive/nonviolent institutional violations (*b* = .033, *Wald* = 163.03, $p < .001$), such that as ANT scores increased, the likelihood that an individual was adjudicated for a nonaggressive/nonviolent violation increased. Inmates scoring above the clinical range on ANT were 1.33 times more likely to have committed a nonaggressive/nonviolent infraction than inmates scoring below the clinical range.

As can be seen in Table 39, although the strength of prediction across PAI scales tended to be smallest for nonaggressive/nonviolent infractions when compared to other infraction categories, the majority of scales were significant predictors of whether or not an individual had been adjudicated for a nonaggressive/nonviolent infraction after controlling for the number of days incarcerated. Besides ANT, INF (b = .009, *Wald* = 26.91, p < .001) and RXR (b = .009, *Wald* = 22.80, p < .001) were the next strongest predictors of nonaggressive/nonviolent violations. SCZ (b = - .008, *Wald* = 20.66, p < .001), NIM (b = - .006, *Wald* = 20.81, p < .001), and ALC (b = - .005, *Wald* = 19.99, p < .001) were significant negative predictors, such that scale elevations were associated with a lower likelihood of committing a nonaggressive/nonviolent infractions. Despite being significant predictors of adjudication for all other infraction categories, ICN (b = .001, *Wald* = 0.431, p = .511), PAR (b = .002, *Wald* = 1.85, p = .174), and VPI (b = .002, *Wald* = 2.43, p = .119) were not significant predictors of whether or not an inmate had been adjudicated for a nonaggressive/nonviolent violation.

Predictive Validity After Controlling for Time Incarcerated, Age, Ethnicity, Gender, and Gang Affiliation

In order to determine whether a similar pattern of significant predictors of institutional misconduct across PAI scales would be demonstrated after further controlling for three additional demographic variables shown to be associated with institutional infractions (i.e., age, gender, and gang affiliation), a second series of hierarchical binary logistic regressions were calculated. In addition, the variance associated with subject ethnicity was also included as a control variable in order to examine whether previously significant predictors could predict institutional violations

Table 39

Predictive Validity of PAI Scales in the Prediction of Adjudication for a Nonaggressive Aggressive/Nonviolent Institutional Infraction After Controlling for Time Served

Scale	*b*	*Wald*	Odds Ratio Associated with Clinical Elevation
ICN [a]	.001	0.43	1.11 (NS)
INF [a]	.009	26.91***	1.26
NIM [a]	- .006	20.81***	0.85
PIM [a]	.005	8.91**	1.09 (NS)
MAN [b]	.008	18.72***	1.16 (NS)
PAR [b]	.002	1.85	0.98 (NS)
SCZ [b]	- .008	20.66***	0.79
BOR [b]	- .003	3.38	0.91 [c]
ANT [b]	.018	109.71***	1.33
ALC [b]	- .005	19.99***	0.84
DRG [b]	.002	2.59	1.07 (NS)
AGG [b]	.006	16.76***	1.09 (NS)
RXR [b]	.009	22.88***	0.99 (NS)
DOM [b]	.014	50.85***	1.22
VPI [b]	.002	2.43	1.06 (NS)

Note. Clinical scale elevation = *t* score of 70 or higher. NS = $p > .05$.
[a] $N = 17{,}054$; [b] $N = 14{,}671$; ; [c] Although BOR was not a significant predictor, a BOR *t* score of 70 or higher was significantly predictive of nonaggressive/nonviolent infractions ($b = -.100$, *Wald* = 3.93, $p = .047$).
* $p < .05$; ** $p < .01$; *** $p < .001$.

independent of inmate ethnicity. To highlight the effect of controlling for these additional demographic variables on the strength of prediction, a difference score that represented the loss/gain in predictive strength (i.e., *b* weights) when compared to the previous analyses that only controlled for time incarcerated was computed.

Any infraction. A hierarchical binary logistic regression was computed to determine if ANT significantly predicted whether or not an inmate had been adjudicated for any institutional infraction after controlling for the number of days incarcerated, age, gender, ethnicity, and gang affiliation. Institutional infractions were regressed in two steps. The number of days incarcerated, age, gender, ethnicity, and gang affiliation were entered in the first step to determine how much variance they accounted for as a whole. ANT was entered in the second step to determine if it added any variance to the prediction equation. The regression equation in the first step with only the control variables entered was a significant predictor of whether or not an individual had been adjudicated for any type of infraction (X^2 [8, N = 14,668] = 495.57, $p < .001$). Likewise, the final model with ANT entered into the equation was a significant predictor of adjudication for a nonaggressive/nonviolent infraction (X^2 [9, N = 14,668] = 549.53, $p < .001$). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor of committing an institutional violation after controlling for the effects of time served, age, gender, ethnicity, and gang affiliation (b = .012, *Wald* = 53.99, $p < .001$), such that as ANT scores increased, the likelihood that an individual was adjudicated for an institutional infraction increased. Although ANT remained the strongest significant predictor across PAI scales of whether or not an inmate was adjudicated for any institutional infraction, comparison of *b* weight change after controlling for age, gender, ethnicity, and gang affiliation revealed that the predictive power of ANT had been reduced by 32% (from b = .017 to b = .012).

As can be seen in Table 40, although the strength of prediction across scales decreased somewhat after controlling for the additional demographic variables, 10 of 15 scales remained significant predictors of adjudication for any institutional infraction. Three scales that had been significant predictors after controlling for time served were no longer significant after controlling for the variance associated with age, gender, ethnicity, and gang affiliation (ICN [b = .004, *Wald* = 3.52, p = .061], PAR [b = .000, *Wald* = 0.00, p = .965], and VPI [b = .001, *Wald* = 1.56, p = .212]). NIM (b = - .006, *Wald* = 19.76, p < .001), SCZ (b = - .003, *Wald* = 5.50, p = .019), and ALC (b = .004, *Wald* = 5.18, p = 0.16) remained significant negative predictors after controlling for these demographic variables, such that higher scores were associated with a lower likelihood of committing any type of infraction during incarceration.

Physically aggressive/violent infractions. A hierarchical binary logistic regression was computed to determine if ANT significantly predicted whether or not an inmate had been adjudicated for a physically aggressive/violent infraction after controlling for the number of days incarcerated, age, gender, ethnicity, and gang affiliation. Physically aggressive/violent institutional infractions were regressed in two steps. The number of days incarcerated, age, gender, ethnicity, and gang affiliation were entered in the first step to determine how much variance they accounted for as a group, ANT was entered in the second step. The regression equation in the first step with only the control variables entered was a significant predictor of adjudication for a physically aggressive/violent

Table 40
Impact on the Predictive Validity of PAI Scales in the Prediction of Adjudication For Any Institutional Infraction After Controlling for Time Incarcerated, Age, Gender, Ethnicity, and Gang Affiliation

Scale	*b*	*Wald*	*b* Difference	*p* Change
ICN [a]	.004	3.52	.000	No Longer Sig.
INF [a]	.003	3.93*	.000	No Change
NIM [a]	- .006	19.78***	.000	No Change
PIM [a]	.004	8.63**	.000	No Change
MAN [b]	.006	10.12**	- .005	No Change
PAR [b]	.000	0.01	- .003	No Longer Sig.
SCZ [b]	- .003	5.50*	+ .002	No Change
BOR [b]	- .002	1.65	- .001	No Change
ANT [b]	.012	53.99**	- .005	No Change
ALC [b]	- .002	5.81*	+ .001	No Change
DRG [b]	.001	0.62	.000	No Change
AGG [b]	.007	22.48***	- .002	No Change
RXR [b]	.008	18.11***	- .008	No Change
DOM [b]	.012	45.25***	- .002	No Change
VPI [b]	.001	1.56	- .003	No Longer Sig.

Note. *b* difference score represents the change in the predictive strength after adding age, gender, ethnicity, and gang affiliation to time served in Step 1 of the regression equation. *P* change indicates the effect on the significance of individual predictors after further controlling for age, gender, ethnicity, and gang affiliation.
[a] N = 17,054; [b] N = 14,671.
* $p < .05$; ** $p < .01$; *** $p < .001$.

infraction (X^2 [8, N = 14,668] = 511.83, p < .001). Likewise, the final model with ANT entered into the equation was a significant predictor of whether or not an individual had been adjudicated for a physically aggressive infraction (X^2 [9, N = 14,668] = 551.57, p < .001). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor of adjudication for a physically aggressive/violent institutional violation even after controlling for the effects of time served, age, gender, ethnicity, and gang affiliation (b = .018, *Wald* = 40.52, p < .001), such that as ANT scores increased, the likelihood that an individual was adjudicated for a physically aggressive infraction increased.

Additional regression analyses revealed that, although ANT remained a significant predictor of whether or not an inmate committed a physically aggressive/violent infraction, the inclusion of age, gender, ethnicity, and gang affiliation resulted in AGG overtaking ANT as the strongest individual predictor of physically aggressive/violent infractions across scales (b = .019, *Wald* = 64.11, p < .001). Despite a general reduction in predictor strength, the majority of scales that had been significant predictors of physically aggressive/violent infractions after controlling for time served remained significant after additionally controlling for the variance associated with age, gender, ethnicity, and gang affiliation. However, PIM (b = - .005, *Wald* = 3.78, p = .052) and PAR (b = .004, *Wald*, p = .184) were no longer significant predictors after controlling for these demographic variables (see Table 41).

Verbally aggressive/defiant infractions. Similarly, a hierarchical binary logistic regression was computed to determine if ANT significantly predicted whether or not an inmate had been adjudicated for a verbally aggressive/defiant infraction after controlling

Table 41
Impact on the Predictive Validity of PAI Scales in the Prediction of Adjudication for a Physically Aggressive/Violent Institutional Infraction After Controlling for Time Served, Age, Gender, Ethnicity, and Gang Affiliation

Scale	*b*	*Wald*	*b* Difference	*p* Change
ICN [a]	.010	9.25**	- .004	No Change
INF [a]	.010	10.74**	- .012	No Change
NIM [a]	.003	2.36	- .001	No Change
PIM [a]	- .005	3.78	+ .001	No Longer Sig.
MAN [b]	.012	14.75***	- .011	No Change
PAR [b]	.004	1.76	- .009	No Longer Sig.
SCZ [b]	.003	1.31	+ .003	No Change
BOR [b]	.005	3.98*	- .003	No Change
ANT [b]	.018	40.52***	-. 015	No Change
ALC [b]	- .001	0.18	+ .002	No Change
DRG [b]	.003	4.17*	- .001	No Change
AGG [b]	.019	64.11***	- .009	No Change
RXR [b]	- .001	0.18	- .003	No Change
DOM [b]	.015	22.22***	- .007	No Change
VPI [b]	.009	24.28***	- .006	No Change

Note. *b* difference score represents the change in the predictive strength after adding age, gender, ethnicity, and gang affiliation to time served in Step 1 of the regression equation. *P* change indicates the effect on the significance of individual predictors after further controlling for age, gender, ethnicity, and gang affiliation.
[a] N = 17,054; [b] N = 14,671.
* $p < .05$; ** $p < .01$; *** $p < .001$.

for the number of days incarcerated, age, gender, ethnicity, and gang affiliation. The regression equation in the first step with only the control variables entered was a significant predictor of whether or not an individual had been adjudicated for committing a verbally aggressive/defiant violation (X^2 [8, N = 14,668] = 409.15, $p < .001$). Likewise, the final model with ANT entered into the equation was a significant predictor (X^2 [9, N = 14,668] = 481.56, $p < .001$). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor of adjudication for a verbally aggressive/defiant institutional infraction even after controlling for the effects of time served, age, gender, ethnicity, and gang affiliation (b = .016, *Wald* = 72.90, $p < .001$) such that as ANT scores increased, the likelihood that an individual was adjudicated for a verbally aggressive/defiant infraction increased.

As can be seen in Table 42, additional logistic regression analyses resulted in ANT remaining the single strongest predictor of verbally aggressive/defiant infractions across PAI scales after controlling for the number of days incarcerated, age, gender, ethnicity, and gang affiliation. With the exception of BOR (b = .003, *Wald* = 2.60, p = .106), each PAI scale that had been found to be a significant predictor of verbally aggressive/defiant infractions after controlling for time served remained significant, after the inclusion of these demographic variables.

Nonaggressive/nonviolent infractions. Finally, a hierarchical binary logistic regression was also computed to determine if ANT significantly predicted whether or not an inmate had been adjudicated for a nonaggressive/nonviolent infraction after controlling for the number of days incarcerated, age, gender, ethnicity, and gang affiliation. Institutional infractions were regressed in two steps. The regression equation

Table 42

Impact on the Predictive Validity of PAI Scales in the Prediction of Adjudication for a Verbally Aggressive/Defiant Institutional Infraction After Controlling for Time Served, Age, Gender, Ethnicity, and Gang Affiliation

Scale	*b*	*Wald*	*b* Difference	*p* Change
ICN [a]	.007	11.34**	- .002	No Change
INF [a]	.004	4.97*	- .007	No Change
NIM [a]	.000	0.01	.000	No Change
PIM [a]	.001	0.32	+ .001	No Change
MAN [b]	.011	20.90***	- .007	No Change
PAR [b]	.006	10.09**	- .004	No Change
SCZ [b]	.003	2.85	+ .002	No Change
BOR [b]	.003	2.61	- .002	No Longer Sig.
ANT [b]	.016	72.90***	- .008	No Change
ALC [b]	.000	0.11	+ .002	No Change
DRG [b]	.001	0.40	.000	No Change
AGG [b]	.010	42.26***	- .004	No Change
RXR [b]	.005	6.56*	- .002	No Change
DOM [b]	.011	28.79***	- .004	No Change
VPI [b]	.006	20.26***	- .003	No Change

Note. *b* difference score represents the change in the predictive strength after adding age, gender, ethnicity, and gang affiliation to time served in Step 1 of the regression equation. *P* change indicates the effect on the significance of individual predictors after further controlling for age, gender, ethnicity, and gang affiliation.
[a] N = 17,054; [b] N = 14,671.
* $p < .05$; ** $p < .01$; *** $p < .001$.

in the first step with only the control variables entered was a significant predictor of whether or not an individual was adjudicated for committing a nonaggressive/nonviolent infraction (X^2 [8, *N* = 14,668] = 289.50, $p < .001$). Likewise, the final model with ANT entered into the equation was a significant predictor (X^2 [9, *N* = 14,668] = 326.48, $p <$ .001). Examination of the relative contribution of ANT to the final regression equation revealed it to be a significant positive predictor of nonaggressive/nonviolent adjudication even after controlling for the effects of time served, age, gender, ethnicity, and gang affiliation ($b = .011$, *Wald* = 37.23, $p < .001$), such that as ANT scores increased, the likelihood that an individual was adjudicated for a physically aggressive infraction increased.

Additional regression analyses revealed that, although ANT remained a significant predictor of whether or not an inmate committed a nonaggressive/nonviolent infraction, the inclusion of age, gender, ethnicity, and gang affiliation resulted in DOM overtaking ANT as the strongest individual predictor of committing a non-aggressive/nonviolent infraction across scales ($b = .012$, *Wald* = 35.84, $p < .001$; see Table 43). As with previous infraction categories, the majority of previously significant predictors remained significant after controlling for these demographic variables, although MAN ($b = .003$, *Wald* = 1.79, $p = .181$) was no longer significant. Of note, the inclusion of age, gender, ethnicity, and gang affiliation to the first step of the regression analysis resulted in BOR becoming a significant negative predictor of nonaggressive/ nonviolent infractions ($b = -\ .004$, *Wald* = 6.97, $p = .008$), such that BOR elevations were associated with a lower likelihood of adjudication for a nonaggressive/nonviolent violation. This change to significance after the inclusion of additional control variables

Table 43

Impact on the Predictive Validity of PAI Scales in the Prediction of Adjudication for a Nonaggressive/Nonviolent Institutional Infraction After Controlling for Time Served, Age, Gender, Ethnicity, and Gang Affiliation

Scale	*b*	*Wald*	*b* Difference	*p* Change
ICN [a]	.001	0.11	.000	No Change
INF [a]	.005	6.90**	- .004	No Change
NIM [a]	- .006	20.11***	.000	No Change
PIM [a]	.005	11.43***	.000	No Change
MAN [b]	.003	1.79	- .005	No Longer Sig.
PAR [b]	- .001	0.27	- .003	No Change
SCZ [b]	- .006	13.63***	+ .003	No Change
BOR [b]	- .004	6.97**	- .001	Now Sig.
ANT [b]	.011	37.23***	- .007	No Change
ALC [b]	- .004	13.58***	+ .001	No Change
DRG [b]	.002	2.52	.000	No Change
AGG [b]	.003	3.89*	- .003	No Change
RXR [b]	.008	16.22***	- .001	No Change
DOM [b]	.012	35.84***	- .002	No Change
VPI [b]	- .001	0.24	- .003	No Change

Note. *b* difference score represents the change in the predictive strength after adding age, gender, ethnicity, and gang affiliation to time served in Step 1 of the regression equation. *P* change indicates the effect on the significance of individual predictors after further controlling for age, gender, ethnicity, and gang affiliation.
[a] N = 17,054; [b] N = 14,671.
* p < .05; ** p < .01; *** p < .001.

represented the only such change in that direction across PAI scales and infraction categories.

Receiver Operating Characteristics

Because institutional infractions, particularly physically aggressive/violent infractions, were found to be low base rate events across the sample (7.5%), additional analyses that were less susceptible to base rates were necessary to impart the relative strength of individual PAI scales in the prediction of institutional misconduct. That is, because the efficiency of correlation methods (e.g., correlational and regression techniques) decrease as base rates depart from .50 (Nunnally & Berstein, 1994), the strength of previously discussed PAI scales in the prediction of adjudication for an institutional infractions were likely suppressed. As previously discussed, ROC analyses have emerged as a popular alternative to traditional prediction methods because they provide an accuracy index (i.e., *AUC*) that is much less dependent on base rates than traditional statistical methods. ROC analyses were undertaken to determine the relative strength of individual PAI scales in the prediction of adjudication for each category of institutional misconduct. Absolute effect sizes for the 95% confidence interval of each *AUC* were interpreted according to the guidelines set forth by Rice and Harris (2005).

Any infraction. ROC analyses undertaken to discern the strength of individual PAI scales in the prediction of adjudication for any institutional infraction showed that, although 13 of 15 scales were significant predictors of whether or not an inmate committed an institutional infraction, similar to the regression and correlation analyses, the direction and absolute accuracy of prediction varied according to the scale under investigation. ANT was the strongest individual predictor across PAI scales (*AUC* = .567, *SE* = .005, *p* < .001) and was the only scale to reach the necessary threshold to be classified as a small effect size (Rice & Harris, 2005). DOM (*AUC* = .542, *SE* = .005, *p* < .001), AGG (*AUC* = .537, *SE* = .005, *p* < .001), and MAN *AUC* = .567, *SE* = .005, *p* < .001) remained significant positive predictors, such that scale elevations were associated with greater likelihood of adjudication for any infraction. Two scales (NIM [*AUC* = .477, *SE* = .005, *p* < .001] and SCZ [.*AUC* = .483, *SE* = .005, *p* = .001]) were significant negative predictors, such that scale elevations were associated with a lower likelihood of adjudication. Neither ALC (*AUC* = .491, *SE* = .005, *p* = .063) nor BOR (*AUC* = .500, *SE* = .005, *p* = .922) were significant predictors of adjudication for an institutional infraction (see Table 44).

Physically aggressive/violent infractions. Because the base rate of physically aggressive/violent infractions was the lowest among infraction categories (i.e., 7.5%), estimates of the predictive validity of individual PAI scales in the prediction of adjudication for physically aggressive/violent violations were the most susceptible to base rate suppression among previous computations. In fact, according to Nunnally and Berstein (1994), the maximum correlation that could have been obtained for a perfect continuous variable in the prediction of a dichotomous outcome variable with a similar base rate of occurrence would have been about .50. Thus, in order to examine the predictive accuracy of PAI scales in the prediction of adjudication for a physically aggressive/violent infraction independent of base rate, a series of ROC analyses were undertaken.

Several scales were significant predictors of adjudication for physically aggressive/violent infractions. Similar to any infraction type, ANT was the single

Table 44

Receiver Operating Characteristics in Among PAI Scales in the Prediction of Adjudication for Any Infraction

Scale	AUC	*SE*	95 % Confidence Interval	*d Equivalent* [c]
ICN [a]	.510*	.005	.501 - .519	.04
INF [a]	.524***	.005	.515 - 533	.09
NIM [a]	.477***	.005	.468 - 486	- .08
PIM [a]	.511*	.005	.502 - .520	.04
MAN [b]	.536***	.005	.527 - .546	.13
PAR [b]	.511*	.005	.501 - .521	.04
SCZ [b]	.483**	.005	.473 - .493	- .06
BOR [b]	.500	.005	.491 - .510	.00
ANT [b]	.567***	.005	.538 - .577	.24
ALC [b]	.491	.005	.481 - .500	- .03
DRG [b]	.514**	.005	.504 - .523	.05
AGG [b]	.537***	.005	.528 - .547	.13
RXR [b]	.526***	.005	.516 - .535	.09
DOM [b]	.542***	.005	.532 - .551	.15
VPI [b]	.512***	.005	.512 - .532	.04

Note. *AUC* = Area under the curve; *SE* = Standard Error; Asymptotic Significance: Null hypothesis = True AUC equals .5.

[a] N= 17,054; [b] N= 14,671; [c] Rice and Harris (2005).

* p < .05; ** p < .01; *** p < .001.

strongest predictor across scales (*AUC* = .614, *SE* = .009, *p* < .001), demonstrating an effect size equivalent to a *Cohen's d* of .41, which approached moderate predictive accuracy (Rice & Harris, 2005). The effect size displayed for AGG (*AUC* = .608, *SE* = .009, *p* < .001) was of similar predictive strength as ANT (see Figure 6), and four additional scales demonstrated small significant effect sizes (VPI [*AUC* = .576, *SE* = .009, *p* < .001], MAN [*AUC* = .569, *SE* = .009, *p* < .001], INF [*AUC* = .559, *SE* = .008, *p* < .001], and DOM [*AUC* = .556, *SE* = .009, *p* < .001]). In addition, four scales were significant positive predictors but did not reach the necessary threshold for a designation of a small effect size. PIM was the only scale that remained a significant negative predictor (*AUC* = .480, *SE* = .008, *p* = .015), such that PIM elevations were associated with a decreased likelihood of adjudication for a physically aggressive/violent infraction. NIM, SCZ, ALC, DRG, and RXR did not reach significance as predictor variables. Overall, despite a much lower base rate of occurrence, the PAI demonstrated greater predictive accuracy in the prediction of adjudication for physically aggressive/violent infractions when compared to the prediction of adjudication for any infraction type (see Table 45).

Verbally aggressive/defiant infractions. ROC analyses were also computed to examine the predictive accuracy of PAI scales in the prediction of verbally aggressive/defiant infractions independent of base rate. ANT (*AUC* = .581, *SE* = .006, *p* < .001), MAN (*AUC* = .556, *SE* = .006, *p* < .001), and AGG (*AUC* = .554, *SE* = .006, *p* < .001) were the strongest individual predictors among scales, such that elevations among these scales were associated with a greater likelihood of adjudication for a verbally aggressive/defiant infraction. Although 10 of 15 scales were significant predictors, ANT,

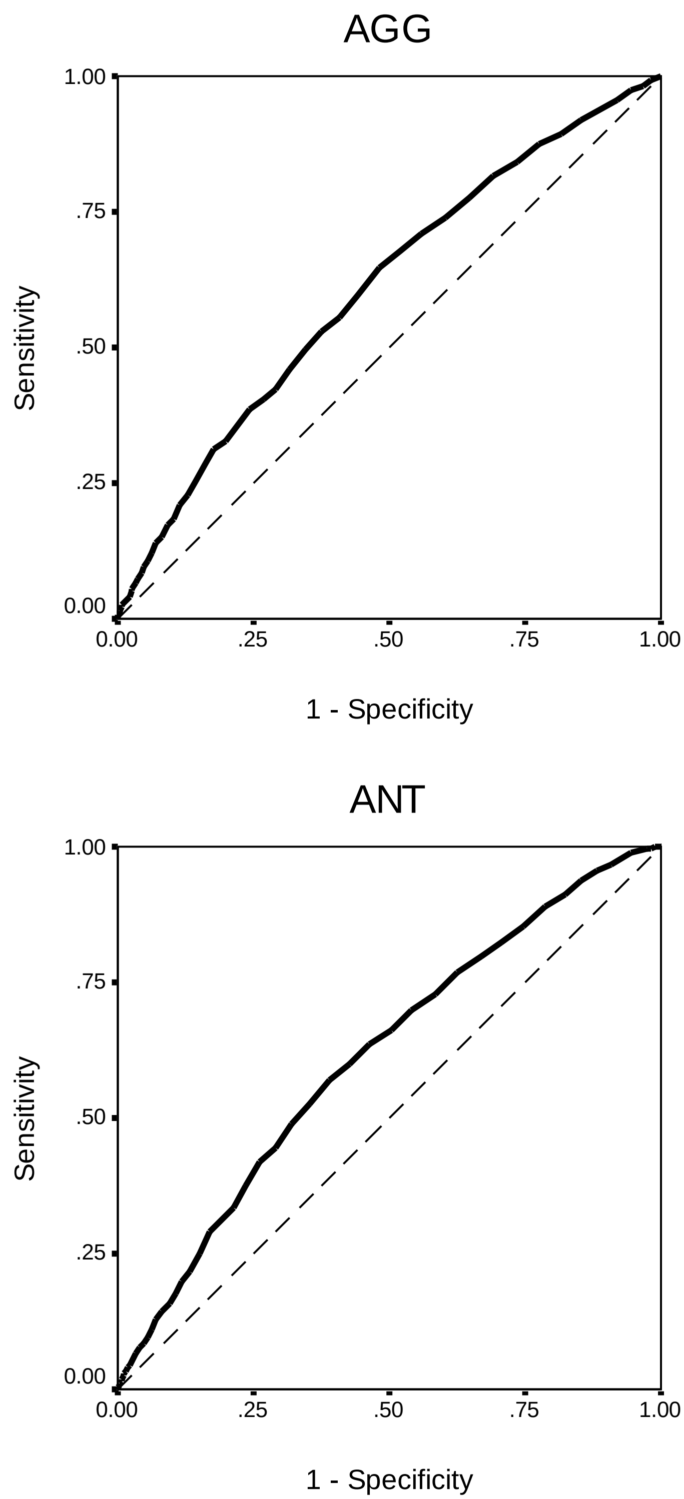


Figure 6. Receiver Operating Characteristics of ANT (*AUC* = .614) and AGG (*AUC* = .608) in the prediction of physically aggressive/violent infractions.

Table 45
Receiver Operating Characteristics in the Prediction of Adjudication for a Physically Aggressive/Violent Infraction

Scale	AUC	*SE*	95 % Confidence Interval	*d Equivalent* [c]
ICN [a]	.536***	.008	.519 - 512	.13
INF [a]	.559***	.008	.542 - .575	.21
NIM [a]	.509	.009	.492 - .526	.03
PIM [a]	.480*	.009	.463 - .496	- .07
MAN [b]	.569***	.009	.551 - .587	.24
PAR [b]	.543***	.009	.526 - .561	.15
SCZ [b]	.496	.009	.478 - 514	.01
BOR [b]	.531**	.009	.513 - 548	.11
ANT [b]	.614***	.009	.597 - .631	.41
ALC [b]	.490	.009	.473 - .508	.03
DRG [b]	.516	.009	.499 - .534	.06
AGG [b]	.608***	.009	.590 - .625	.39
RXR [b]	.511	.009	.493 - .529	.04
DOM [b]	.556***	.009	.539 - .574	.20
VPI [b]	.576***	.009	.558 - .593	.27

Note. *AUC* = Area under the curve; *SE* = Standard Error; Asymptotic Significance: Null hypothesis = True AUC equals .5.
[a] N= 17,054; [b] N= 14,671; [c] Rice and Harris (2005).
* $p < .05$; ** $p < .01$; *** $p < .001$.

MAN, AGG, and INF were the only scales that reached the threshold for a classification of a small effect size (Rice & Harris, 2005). No significant negative predictor variables were found across scales. NIM (*AUC* = .500, *SE* = .005, *p* = .975), PIM (*AUC* = .499, *SE* = .005, *p* = .896), SCZ (*AUC* = .503, *SE* = .006, *p* = .611), ALC (*AUC* = .495, *SE* = .006, *p* = .385), and DRG (*AUC* = .508, *SE* = .006, *p* = .165) were not significant predictors of adjudication for a verbally aggressive/defiant infraction (see Table 46).

Nonaggressive/nonviolent infractions. Although ROC analyses revealed the majority of PAI scales to be significant predictors of adjudication for a nonaggressive/nonviolent infraction, ANT was the only scale that reached Rice and Harris's (2005) threshold for designation of a small effect size (*AUC* = .564, *SE* = .006, *p* < .001). Three scales were significant negative predictors (NIM [*AUC* = .474, *SE* = .005, *p* < .001], SCZ [*AUC* = .477, *SE* = .006, *p* < .001], and ALC [*AUC* = .481, *SE* = .006, *p* = .001]), such that scale elevations were associated with a decreased likelihood of adjudication for a nonaggressive/nonviolent violation (see Table 47).

Predictive Validity of Demographic/Historical Variables

A series of hierarchical binary logistic regressions were calculated to determine the predictive validity of several individual demographic and historical variables in the prediction of each category of institutional misconduct after controlling for the variance associated with the number of days incarcerated. To facilitate communication of individual effect sizes and to allow for comparisons with individual PAI scales in the prediction of misconduct, odds ratios and ROC curves were generated, when applicable.[4]

[4] Although ROC analyses were the preferred methodology because of their previously discussed resistance to the effects of base rate, the majority of the demographic/historical variables were dichotomous and/or categorical variables and thus ROC curves were not appropriate as an estimate of predictive accuracy in many cases.

Table 46

Receiver Operating Characteristics in the Prediction of Adjudication for a Verbally Aggressive/Defiant Infraction

Scale	AUC	*SE*	95 % Confidence Interval	*d Equivalent* [c]
ICN [a]	.521***	.005	.510 - .531	.07
INF [a]	.532***	.005	.522 - .531	.11
NIM [a]	.500	.005	.489 - .510	.00
PIM [a]	.499	.005	.489 - .510	.00
MAN [b]	.556	.006	.545 - .567	.20
PAR [b]	.537***	.006	.526 - .548	.13
SCZ [b]	.503	.006	.492 - .514	.01
BOR [b]	.519**	.006	.508 - .530	.07
ANT [b]	.581***	.006	.570 - .592	.29
ALC [b]	.495	.006	.484 - .506	- .02
DRG [b]	.508	.006	.497 - .519	.03
AGG [b]	.554***	.006	.543 - .565	.19
RXR [b]	.519**	.006	.508 - .531	.07
DOM [b]	.540***	.006	.529 - .551	.14
VPI [b]	.544***	.006	.533 - .555	.16

Note. *AUC* = Area under the curve. Asymptotic Significance: Null hypothesis = True AUC equals .5; *SE* = Standard Error.

[a] N= 17,054; [b] N= 14,671; [c] Rice and Harris (2005).

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 47

Receiver Operating Characteristics in the Prediction of Adjudication for a Nonaggressive/Nonviolent Infraction

Scale	AUC	*SE*	95 % Confidence Interval	*d Equivalent* [c]
ICN [a]	.502	.005	.492 - .512	.01
INF [a]	.526***	.005	.516 - .536	.09
NIM [a]	.474***	.005	.464 - .484	- .09
PIM [a]	.516**	.005	.505 - .526	.06
MAN [b]	.527***	.006	.516 - .537	.09
PAR [b]	.508	.006	.497 - .519	.03
SCZ [b]	.477***	.006	.466 - .488	- .08
BOR [b]	.492	.006	.482 - .503	- .03
ANT [b]	.564***	.006	.554 - .575	.23
ALC [b]	.481**	.006	.470 - .492	- .07
DRG [b]	.516**	.006	.505 - .526	.06
AGG [b]	.527***	.006	.516 - .538	.09
RXR [b]	.527***	.006	.517 - .538	.09
DOM [b]	.542***	.006	.531 - .552	.15
VPI [b]	.514*	.006	.503 - .525	.05

Note. *AUC* = Area under the curve; *SE* = Standard Error; Asymptotic Significance: Null hypothesis = True AUC equals .5.

[a] N= 17,054; [b] N= 14,671; [c] Rice and Harris (2005).

* $p < .05$; ** $p < .01$; *** $p < .001$.

Gender

A hierarchical binary logistic regression was computed to determine if gender significantly predicted whether or not an inmate was adjudicated for any type of institutional infraction after controlling for the amount of time served. Institutional violations were regressed in two steps. The number of days incarcerated was entered in the first step and gender was then entered in the second step to determine if it added any variance to the prediction equation. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 17,054] = 167.62, $p < .001$). Likewise, the final model with gender entered into the equation was a significant predictor of whether or not an individual had been adjudicated for any type of infraction (X^2 [2, N = 17,054] = 245.41, $p < .001$). Examination of the relative contribution of gender to the final regression equation revealed it to be a significant positive predictor of institutional violations (b = .462, *Wald* = 73.95, $p < .001$), such that male subjects were 1.59 times more likely to have been adjudicated for any infraction than female subjects.

Similar procedures were undertaken for each infraction category, which demonstrated gender to be a significant predictor of each infraction type ($p < .001$). Among infraction categories, gender was most predictive of adjudication for a physically aggressive/violent infraction (b = .732, *Wald* = 37.43, $p < .001$), such that male inmates were 2.08 times more likely to commit a physically aggressive/violent infraction than female subjects. Gender was also significantly predictive of adjudications for a verbally aggressive/defiant (b = .301, *Wald* = 24.11, $p < .001$, *OR* = 1.35) and nonaggressive/ nonviolent infraction (b = .421, *Wald* = 46.77, $p < .001$, *OR* = 1.52), with male subjects demonstrating greater likelihood of adjudication for these infraction types when compared to female subjects.

Age

A hierarchical binary logistic regression was computed to determine if age significantly predicted whether or not an inmate was adjudicated for any type of institutional infraction after controlling for the amount of time served. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 17,054] = 14.05, $p < .001$). Likewise, the final model with age entered into the equation was a significant predictor of whether or not an individual committed any type of infraction (X^2 [2, N = 17,054] = 389.27, $p < .001$). Examination of the relative contribution of age to the final regression equation revealed it to be a significant negative predictor of institutional violations (b = - .037, *Wald* = 747.76, $p < .001$), such that the likelihood of adjudication for any infraction decreased as age increased.

The results of additional regression analyses revealed age to be a significant negative predictor of each infraction type. Among infraction categories, age was the strongest predictor of physically aggressive/violent violations (b = - .062, *Wald* = 319.29, $p < .001$), followed by verbally aggressive/defiant infractions (b = - .037, *Wald* = 347.76, $p < .001$), and nonaggressive/nonviolent infractions (b = - .026, *Wald* = 196.94, $p < .001$). ROC analyses were undertaken to assess strength of age as a predictor of institutional misconducts independent of base rate. Small significant effect sizes ($p < .001$) were demonstrated for age in the prediction of adjudication for any infraction (*AUC* = .428, *SE* = .005), verbally aggressive/defiant infractions (*AUC* = .400, *SE* = .005), and nonaggressive/nonviolent infractions (*AUC* = .432, *SE* = .005). Age displayed a moderate effect size equivalent to a Cohen's *d* of .622 (Rice & Harris, 2005) in the prediction of adjudication for physically aggressive/violent infractions (*AUC* = .342, *SE* = .008, $p < .001$; see Figure 7).

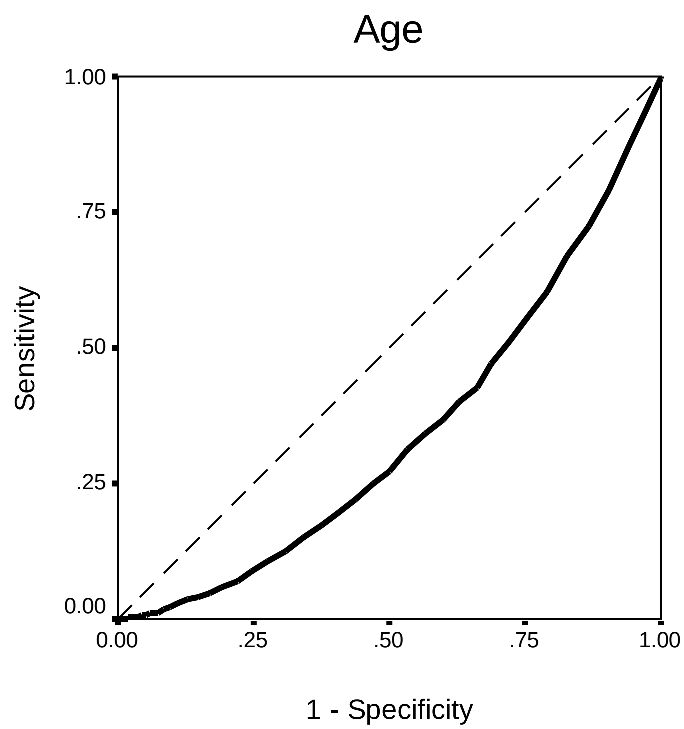


Figure 7. Receiver Operating Characteristic of age in the prediction of adjudication for a physically aggressive/violent infraction.

Profile Validity

A hierarchical binary logistic regression was computed to determine if overall PAI profile validity significantly predicted whether or not an inmate was adjudicated for any type of institutional infraction during the study period after controlling for the amount of time served. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 17,054] = 167.62, $p < .001$). Likewise, the final model with profile validity entered into the equation was a significant predictor of whether or not an individual committed any type of infraction (X^2 [2, N = 17,054] = 167.67, $p < .001$). However, examination of the relative contribution of profile validity to the final regression equation revealed it to be nonsignificant in the prediction of any institutional violation (b = .011, *Wald* = 0.52, p = .820). Similar analyses demonstrated that PAI profile validity did not significantly contribute to the prediction of adjudication for verbally aggressive/defiant (b = .076, *Wald* = 2.10, p = .147) or nonaggressive/ nonviolent infractions (b = .020, *Wald* = 0.15, p = .698). However, overall profile validity was a significant predictor of physically aggressive/violent infractions (b = .203, *Wald* = 6.65, $p < .010$), such that individuals who produced invalid PAI profiles were 1.23 times more likely to have committed a physically aggressive/violent infraction than individuals who produced valid PAI profiles.

Gang Affiliation

A hierarchical binary logistic regression was calculated to determine if gang affiliation significantly predicted whether or not an inmate was adjudicated for any type of institutional infraction during the study period after controlling for the amount of time incarcerated. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 17,054] = 161.62, p < .001). Likewise, the final model with gang affiliation entered into the equation was a significant predictor of whether an individual committed any type of infraction (X^2 [2, N = 17,054] = 186.527, p < .001). Examination of the relative contribution of gang affiliation to the final regression equation revealed gang affiliate status to be a significant positive predictor of institutional violations (b = .243, *Wald* = 19.20, p < .001), such that gang affiliates were 1.25 times more likely to have been adjudicated for any infraction when compared to nonaffiliated inmates.

The results of additional hierarchical binary logistic regression analyses revealed gang affiliate status to be a significant positive predictor of adjudication for a physically aggressive/violent infraction (b = 1.23, *Wald* = 284.47, p < .001), a verbally aggressive/ defiant infraction (b = .419, *Wald* = 49.71, p < .001), or a nonaggressive/nonviolent infraction (b = .363, *Wald* = 37.42, p < .001). The largest effect for gang affiliation was demonstrated for physically aggressive/violent infractions, such that gang-affiliated inmates were 3.42 times more likely to have been adjudicated for a physically aggressive/violent infraction than non-affiliated inmates. They were about 1.5 times more likely to have committed a verbally aggressive/defiant or nonaggressive/nonviolent infraction.

Index Offense

A hierarchical binary logistic regression was calculated to determine if index offense significantly predicted whether or not an inmate was adjudicated for any type of institutional infraction during the study period after controlling for the amount of time served. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 17,034] = 167.17, p < .001). Likewise, the final model with index offense entered into the equation was a significant predictor of whether an individual committed any type of infraction (X^2 [3, N = 17,034] = 647.39, p < .001). As can be seen in Table 48, when broken down according to type of index offense, incarceration for crimes against persons was a significant negative predictor of adjudication for each infraction category. Likewise, being incarcerated for a property crime was associated with greater likelihood of adjudication for institutional misconduct than incarceration for other index offenses. A similar pattern as property crimes emerged for statutory crimes, although a statutory index offense was not significantly predictive of physically aggressive/violent infractions (b = - .054, *Wald* = 0.70, p = .435).

Prior Incarceration

A hierarchical binary logistic regression was calculated to determine if having been previously incarcerated significantly predicted whether an inmate had been adjudicated for any type of institutional infraction during the study period after controlling for the amount of time served. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 17,054] = 161.10, p < .001). Likewise, the final model with prior incarceration status entered into the equation was a significant predictor of whether an individual committed any type of infraction (X^2 [2, N = 17,054] = 292.22, p < .001). Examination of the relative contribution of prior incarceration status to the final regression equation revealed it to be a significant positive

Table 48
Index Offense and the Prediction of Adjudication for Institutional Misconduct After Controlling for the Number of Days Incarcerated

Index Offense	Infraction Type	*b*	*Wald*	*Odds Ratio*
Person				
	Any Infraction	- .772	453.40***	2.16 [a]
	Physically Aggressive/Violent	- .419	40.86***	1.52 [a]
	Verbally Aggressive/Defiant	- .592	203.79***	1.80 [a]
	Nonaggressive/Nonviolent	- .776	351.45***	2.17 [a]
Property				
	Any Infraction	.522	216.27***	1.68
	Physically Aggressive/Violent	.461	54.71***	1.59
	Verbally Aggressive/Defiant	.431	116.81***	1.54
	Nonaggressive/Nonviolent	.526	182.89***	1.69
Statutory				
	Any Infraction	.286	59.63***	1.33
	Physically Aggressive/Violent	- .054	0.70	1.06
	Verbally Aggressive/Defiant	.176	17.58***	1.19
	Nonaggressive/Nonviolent	.255	38.82***	1.29

Note. N = 17,034.
[a] Odds of adjudication among individuals with non-person index offenses.
*** $p < .001$.

predictor of institutional violations (b = .364, *Wald* = 124.48, $p < .001$), such that inmates who had been previously incarcerated were 1.40 times more likely to have been adjudicated for any infraction when compared to inmates who were incarcerated for the first time.

The results of additional hierarchical binary logistic regression analyses revealed prior incarcerations to be a significant positive predictor for each infraction type. Prior incarceration status was strongest as a predictor of adjudication for nonaggressive/ nonviolent infractions (b = .424, *Wald* = 135.60, $p < .001$, *OR* = 1.53), followed by physically aggressive/violent infractions (b = .290, *Wald* = 24.62, $p < .001$, *OR* = 1.34) and verbally aggressive/defiant infractions (b = .299, *Wald* = 38.30, $p < .001$, *OR* = 1.26).

In order to examine if number of previous incarcerations was a useful predictor of institutional infractions, a series of hierarchical binary logistical regression and ROC analyses were calculated. As can be seen in Table 49, the number of previous incarcerations was a significant positive predictor of each infraction category after controlling for the number of days incarcerated. Although ROC analyses revealed the number of previous incarcerations to be a significant predictor of adjudication for each infraction category, a small effect size was only demonstrated in the case of nonaggressive/nonviolent infractions.

Potential Major Mental Illness

As previously discussed, subjects who completed valid PAI profiles and who displayed marked elevations on MAN, PAR, SCZ, or BOR were categorized as potentially having a major mental illness. In order to determine if status as potentially being mentally ill was a significant predictor of institutional infractions after controlling

Table 49
Binary Logistic Regression and ROC Analyses for the Number of Previous Incarcerations in the Prediction of Adjudication for Institutional Misconduct

	Logistic Regression		ROC		
Infraction Type	*b*	*Wald*	*AUC*	*SE*	*d* [a]
Physically Aggressive/Violent	.026	3.93*	.530***	.008	.10
Verbally Aggressive/Defiant	.029	11.42**	.528***	.005	.10
Nonaggressive/Nonviolent	.063	62.16***	.555***	.005	.20
Any Infraction	.055	52.85***	.549***	.005	.17

Note. N = 17,054. ROC = Receiver Operating Characteristics; *AUC* = Area Under the Curve.
[a] Rice and Harris (2005).
* $p < .05$; ** $p < .01$; $p < .001$.

for the number of days incarcerated, a series of regression analyses were calculated. Beginning with prediction of adjudication for any infraction, a hierarchical binary logistic regression was computed, with the control variable of number of days incarcerated entered in the first step. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 14,671] = 131.32, $p < .001$). Likewise, the final model with potential major mental illness status entered into the equation was a significant predictor of whether an individual committed any type of infraction (X^2 [2, N = 14,671] = 133.63, $p < .001$). However, examination of the relative contribution of potential major mental illness status to the final regression equation revealed it to be nonsignificant in the prediction of adjudication for any institutional violation (b = .129, *Wald* = 2.33, p = .126).

Similar regression analyses revealed potential major mental illness status was not significantly predictive of adjudication for a nonaggressive/nonviolent infraction (b =

.041, *Wald* = 0.19, *p* = .667). However, potential major mental illness status was a significant positive predictor of adjudication for a physically aggressive/violent violations (*b* = .395, *Wald* = 8.53, *p* = .003), such that inmates identified as potentially mentally ill were 1.48 times more likely to have been adjudicated for a violent infraction. Likewise, potential major mental illness was a significant positive predictor of adjudication for a verbally aggressive/defiant infraction (*b* = .247, *Wald* = 7.11, *p* = .008, *OR* = 1.28). Thus, although potentially seriously mentally ill inmates did not appear at greater risk for general institutional misconduct when compared to the general prison population, elevation on PAI scales associated with major mental illness was a risk factor for physically and verbally aggressive behaviors.

Physically Aggressive/Violent Institutional Behavior Prediction Scale

In the final stage of data analysis, multiple regression analyses were undertaken in order to develop an institutional misconduct prediction scheme for use in inmate triage/classification procedures. Because the identification of risk for violent behaviors is of paramount importance to prison officials, an individual scheme for the identification of ODOC inmates most at risk for violent/physically aggressive behaviors was developed.

In order to maximize both practical utility and accuracy of the prediction scheme, certain development strategies were undertaken a priori. First, only those variables that demonstrated univariate predictive utility were included as a potential component of the prediction scheme. Likewise, only variables that were consistently available to ODOC officials upon intake were included for consideration. Forward logistic regression analyses were undertaken in order to identify the smallest number of predictor variables that maximized the predictive accuracy of each scheme. Because the period of risk (i.e., opportunity to obtain an institutional infraction) varied across subjects, the number of days incarcerated was included as a control variable in each analysis. Although significant differences were found across ethnic groups in yearly rates of physically aggressive/violent infractions ($F[4,17047] = 9.74$, $p < .001$), because inclusion of race/ethnicity as a predictive factor is an unconstitutional (*Saldano v. Texas*, 2000) and unethical practice (Cunningham et al., 2005), the influence of ethnicity as a univariate predictor of institutional misconduct was not investigated and inmate ethnicity was not considered for inclusion in either prediction scheme. Finally, because index offense and age were included as potential predictors in the final model, 20 subjects with undocumented index offenses and 1 subject of unknown age were not included in the analysis ($N = 17,033$).

Development

A forward binary logistic regression was conducted to identify the strongest individual model for forecasting risk for institutional violence. Adjudication for a physically aggressive/violent infraction served as the outcome variable and was regressed in several steps. Before analyzing the regression analysis, collinearity diagnostics were calculated for each predictor variable. Tolerance statistics for all variables were above the .1 cutoff recommended by Mertler and Vannatta (2005). Likewise, the variance inflation factor for each predictor was well below the recommended cutoff of 10. Thus, the interrelationships among predictor variables were insufficient to jeopardize analysis with logistic regression.

To control for the variance associated with time incarcerated, the number of days incarcerated was entered in the first step. Each variable that had been previously found to be a significant univariate predictor of physically aggressive/violent infractions was entered in the second step. Only those PAI scales that had remained significant after controlling for the variance associated with time incarcerated, age, ethnicity, gender, and gang affiliation were included for consideration. Thus, the following 15 variables were included for consideration in the final model: MAN, BOR, ANT, DRG, AGG, DOM, VPI, gender, age, PAI validity, gang affiliation, person crime index offense, property crime index offense, prior incarceration, and potential major mental illness (i.e., based on PAI scale scores).

The regression equation with only the control variable entered was a significant predictor of whether or not an individual committed any type of infraction (X^2 [1, N = 17,033] = 9.93, p = .002). As can be seen in Table 50, the forward logistic regression consisted of nine steps, each of which was a significant predictor of adjudication for a physically aggressive/violent infraction ($p < .001$). The final model was significant (X^2 [10, N = 17,033] = 746.98, $p < .001$) and contained nine individual predictor variables after controlling for the variance associated with the number of days incarcerated: age, gang affiliation, AGG, person crime index offense, gender, BOR, prior incarceration status, overall PAI validity, and DRG. Put another way, MAN, ANT, DOM, VPI, and property crime index offense were not included. A Homer-Lemeshow goodness of fit test indicated that the final 9-variable model adequately fit the data (X^2 = 11.01, p = .201).

Age was the first variable selected by the forward selection procedure and was a negative predictor of physically aggressive/violent infractions, such that younger age was associated with increased likelihood of adjudication for a physically aggressive infraction. Gang affiliation, previous incarceration, and PAI invalidity were associated

Table 50

Development of Physically Aggressive/Violent Behavior Prediction Scheme: Results of Forward Logistic Regression

Step	Variable	X^2	*df*	*p*	*b* [a]	*Wald* [a]	*p* [a]	*Odds Ratio* [a]
Step 1		383.69	2	< .001				
	Age				- .060	233.69	< .001	0.94
Step 2		503.46	3	< .001				
	Gang Affiliation				.613	59.57	< .001	1.85
Step 3		573.11	4	< .001				
	AGG				.029	96.43	< .001	1.03
Step 4		644.19	5	< .001				
	Person Crime				- .562	65.11	< .001	0.57
Step 5		686.34	6	< .001				
	Gender (male)				.598	23.66	< .001	1.82
Step 6		714.40	7	< .001				
	BOR				- .013	14.83	< .001	0.99
Step 7		734.09	8	< .001				
	Prior Incarcerations				.319	24.43	< .001	1.38
Step 8		742.28	9	< .001				
	Invalid PAI				.177	4.72	.030	1.19
Step 9		746.98	10	< .001				
	DRG				- .004	4.70	.032	1.00
	Constant				- 1.418	53.47	< .001	0.24

Note. Days incarcerated controlled for in Step 0.

[a] Results reported for Step 9 of regression equation.

with greater likelihood of adjudication for a physically aggressive/violent infraction. Among PAI scales, BOR and DRG scores displayed negative loadings, which indicated that when considered with all potential variables, lower scores were associated with greater likelihood of adjudication. Finally, increased AGG scores were associated with increased risk of adjudication for a physically aggressive/violent behavior.

Classification of Predictor Variables

According to Gagliardi et al. (2004), the decision of whether to classify a variable as a risk or protective factor depends on its causal relationship with the dependent variable; however, as these authors noted, causal relationships are lacking in the violence risk literature, nor do well-formed, falsifiable hypotheses of violence exist that produce *truly* casual hypotheses. Thus, violence risk researchers must adopt alternative strategies when classifying predictor variables as risk or protective factors.

Although the regression equation is useful for describing the nature of the relationship between continuous predictor variables and a dependent variable (i.e., positive vs. negative), it does not answer the question of how to classify predictor variables as risk or protective factors. For example, a strong negative relationship was noted between age and adjudication for a physically aggressive/violent infraction; however, whether this result reflects younger age being a risk factor or older age being a protective factor, or both, remains unanswered by regression weights alone. Similarly, the direction of the relationship between a categorical predictor and a dependent variable is contingent on how the variable is coded. For example, male gender was found to be positively associated with adjudication for a physically aggressive/violent infraction because of the a priori coding scheme (0 = Female vs. 1 = Male). Had gender been coded in the opposite way, a negative relationship would have resulted that would have reflected a lower likelihood of adjudication for female offenders compared to male offenders. Thus, the question of whether male gender is a risk factor and/or female gender is a protective factor, remains unanswered regardless of the coding scheme employed or the nature of the relationship between predictor and dependent variables.

In the absence of a strong theory of violent institutional behaviors, predictor variables were classified using a method similar to one employed by Gagliardi et al. (2004). Each predictor variable was classified on the basis of whether the base rate of adjudication for a given trait was above, below, or at a similar rate as the base rate of adjudication for the entire sample. Given the low base rate of adjudication across the sample (i.e., 7.5%), a base rate difference of ±1% was employed as a classification cutoff.

As can be seen in Table 51, the final classification scheme resulted in multiple protective and risk factor classifications, with several variables being comprised of both types of factors. Gang affiliation and ages younger than 21 were the strongest individual risk factors for adjudication for physically aggressive/violent infractions, both displaying base rates more than twice that of the sample (19 and 15% respectively). Other risk factors included being aged 21 to 25, having been previously incarcerated, completing an invalid PAI, and higher AGG and BOR scores. Four variables included both risk and protective factors, depending on the value of the variable: gang-affiliation, age, and AGG and BOR scores. Lack of gang affiliation status was associated with significantly lower base rates of adjudication than the sample as a whole. Other protective factors included female gender, age above 30, a person crime index offense, and lower AGG and BOR scores. Interestingly, although DRG score was found to be a significant contributor to the

Table 51

Summary of Relative Risk and Protective Factors Included in the Violence Risk Prediction Scale and Associated Base Rates of Adjudication for a Physically Aggressive/Violent Infraction

Predictor Variable	Value	Classification	Base Rate
Age			
	< 21	Risk Factor	15.1 %
	21 to 25	Risk Factor	11.1 %
	26 to 30	-----	8.1 %
	> 30	Protective Factor	4.7 %
Gender			
	Female	Protective Factor	3.9 %
	Male	-----	8.0 %
Gang Affiliation			
	Yes	Risk Factor	19.0 %
	No	Protective Factor	6.4 %
Prior Incarceration			
	Yes	Risk Factor	8.5 %
	No	-----	6.7 %
Person Crime			
	Yes	Protective Factor	6.5 %
	No	-----	8.4 %
PAI Validity			
	Valid	-----	7.3 %
	Invalid	Risk Factor	8.9 %
AGG [a]			
	≤ 39	Protective Factor	3.9 %
	40 to 49	Protective Factor	5.4 %
	50 to 59	-----	7.9 %
	60 to 69	Risk Factor	10.0 %
	70 to 79	Risk Factor	12.6 %
	≥ 80	Risk Factor	13.7 %

Table 51 (cont.)

Predictor Variable	Value	Classification	Base Rate
BOR [a]			
	$\leq$ 39	Protective Factor	4.8 %
	40 to 49	-----	6.8 %
	50 to 59	-----	7.6 %
	60 to 69	-----	7.3 %
	70 to 79	Risk Factor	8.7 %
	$\geq$ 80	Risk Factor	8.8 %
DRG [a]			
	40 to 49	-----	6.6 %
	50 to 59	-----	7.7 %
	60 to 69	-----	8.2 %
	70 to 79	-----	7.9 %
	$\geq$ 80	-----	7.6 %

Note. *N* = 17,033. Physically aggressive/violent infraction base rate = 7.5%.
[a] Valid PAI profiles (*N* = 14,658).

regression model, using the a priori classification scheme no DRG score ranges were associated with significantly lower or higher base rates of physically aggressive/violent infractions.

In order to test the utility of the final model in the prediction of future physically aggressive/violent institutional behaviors, a composite prediction scheme was created by multiplying individual predictors by their respective regression weights and summing the ensuing values. Scores from the resulting prediction scheme (hereafter referred to as the *violence risk prediction scale*, VRPS) ranged from - 4.44 to 2.09, with a mean score of - 1.02 (*SD* = 0.85) and a median score of - 0.986. Examination of score dispersion around the mean revealed a slightly leptokurtic (G_2 = .09) and negatively skewed score distribution (γ_1 = - .18) that resembled a normal curve distribution (see Figure 8).

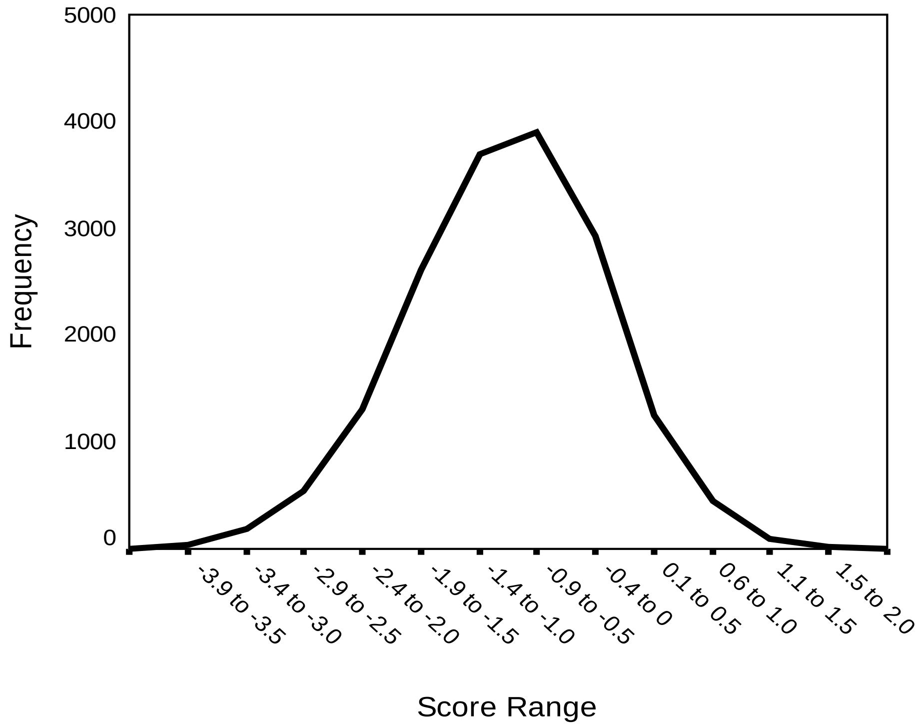


Figure 8. Violence Risk Prediction Scale score (VRPS) distribution.

VPRS Scores and Future Violent Institutional Behaviors

An independent samples *t*-test was conducted to test the hypothesis that inmates who had been adjudicated for a physically aggressive/violent infraction would display significantly higher VRPS scores than inmates who had not been adjudicated for a similar infraction. Before the *t*-test was conducted, a Levene's test of equality of variance was calculated that suggested that the assumption of homogeneity of variances had been violated ($F = 17.76$, $p < .001$). A follow-up variance ratio was calculated that indicated that the significant Levene's test was likely due to the effects of a large sample size rather than unequal variances between groups (*variance ratio* = 1.21); thus the adoption of a more stringent alpha was not necessary before proceeding. A significant difference in VRPS scores was found between groups ($t[17031] = - 26.64$, $p < .001$), such that individuals who had been adjudicated for a physically aggressive/violent infraction had significantly higher VRPS scores (M = - 0.42, SD = 0.76) than individuals who had not been adjudicated for a physically aggressive/violent infraction (M = - 1.07, SD = 0.84).

To test the hypothesis that the VRPS scores would be positively related to physically aggressive/violent infractions, a series of correlational analyses were examined. A Pearson's correlation coefficient was calculated to examine the relationship between VRPS scores and yearly rates of adjudication for physically aggressive/violent infractions. A significant positive relationship was found (r = .20, p < .001), such that higher scores were associated with higher yearly rates of adjudication. A point biserial correlation coefficient was calculated to examine the relationship between VRPS scores and adjudication for a physically aggressive/violent infraction. As with yearly infraction rate, a significant positive relationship was found (r_{pb} = .20, p < .001), such that higher scores were associated with greater likelihood of adjudication. A follow-up partial biserial correlation coefficient that controlled for the number of days incarcerated revealed minimal effect on the relationship between the VRPS scores and adjudication for a physically aggressive/violent infraction after controlling for time incarcerated (*partial* r_{pb} = .20, p < .001). Thus, as hypothesized, positive relationships were demonstrated between VRPS scores and adjudication for physically aggressive/violent infractions. Given the previously discussed ceiling placed on the magnitude of correlation obtainable due the effects of a low base rate of adjudication (e.g., maximum correlation obtainable for an event with a base rate of 10 % is .58), the obtained estimates are suggestive of a robust relationship between these variables.

A hierarchical binary logistic regression was computed to determine if VRPS scores significantly predicted adjudication for a physically aggressive/violent institutional infraction after controlling for the amount of time served. The regression equation in the first step with only the control variable (number of days incarcerated) entered was a significant predictor of whether or not an individual was adjudicated for a physically aggressive/violent infraction (X^2 [1, N = 17,033] = 9.93, p = .002). Likewise, the final model with VRPS score entered into the equation was a significant predictor of adjudication for a physically aggressive/violent infraction (X^2 [2, N = 17,033] = 746.92, $p < .001$). Examination of the relative contribution of VRPS scores to the final regression equation revealed it to be a significant positive predictor (b = 1.00, *Wald* = 657.98, $p < .001$), such that as VRPS scores increased the likelihood that an individual was adjudicated for a physically aggressive/violent institutional violation increased. Odds ratio analysis revealed that a VRPS score increase of 1 was associated with 2.72 times greater likelihood of adjudication for a physically aggressive/violent infraction after controlling for the variance associated with time incarcerated.

ROC analysis was undertaken to examine the predictive accuracy of the VRPS in the prediction of adjudication for a physically aggressive/violent infraction independent of base rate. The VRPS was found to be a strong predictor of adjudication for a physically aggressive/violent infraction (AUC = .715, SE = .007, $p < .001$), demonstrating a large effect size that was equivalent to a Cohen's d greater than 0.8; Rice & Harris, 2005; see Figure 9).

To assist in risk classification and to identify the probability of adjudication associated with specific scores, VRPS scores were categorized into 13 bins that consisted

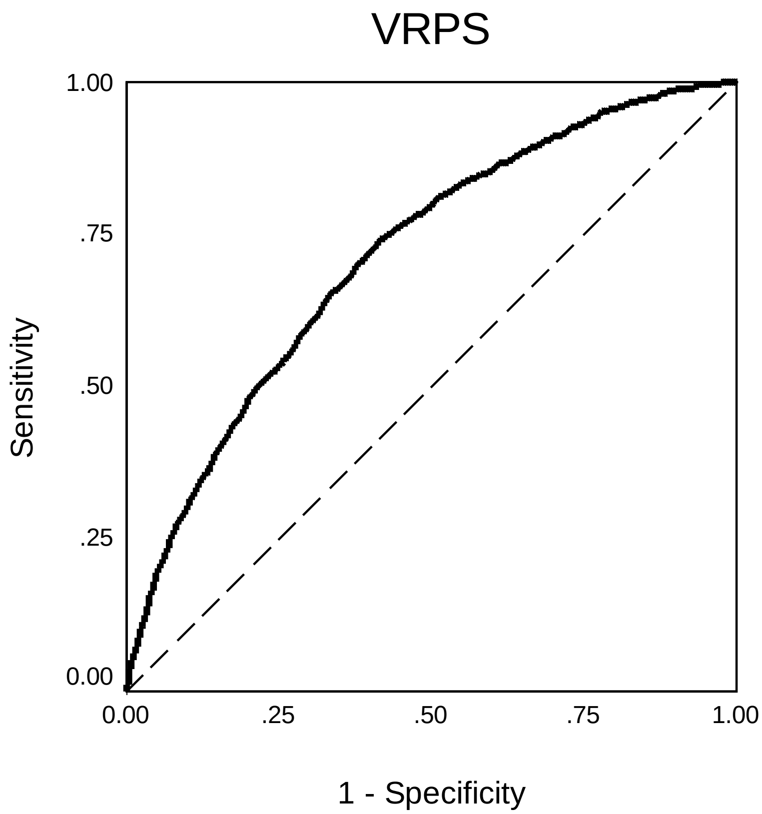


Figure 9. ROC curve for the Violence Risk Prediction Scale (*AUC* = .715)

of score increases of 0.5 points. This value was chosen so as to allow for a relatively small number of meaningful probability estimates. Because only one subject scored above the 2.0 threshold, scores above 1.501 were collapsed into one bin. As can be seen in Table 52, the probability of adjudication for a physically aggressive/violent infraction increased in a linear fashion with VRPS score categories. No subjects whose scores placed them in the lowest three probability bins were adjudicated for a physically aggressive/violent infraction during incarceration. Likewise, the probabilities associated with bins 3 through 7 reflected lower base rates of adjudication than the sample as a whole. The probability of adjudication associated with bin 8 (VRPS score of - 0.99 to

Table 52

Frequency and Base Rates of Adjudication for a Physically Aggressive/Violent Infraction Associated with Violence Risk Prediction Scale Scores and Probability Bins

				Cumulative	Adjudicated	
Probability Bin	Score Range	*n*	%	%	*n*	%
1	≤ - 4.0	9	0.1	0.1	0	0
2	- 3.99 to - 3.50	40	0.2	0.3	0	0
3	- 3.49 to - 3.00	193	1.1	1.4	0	0
4	- 2.99 to - 2.50	539	3.2	4.6	6	1.1
5	- 2.49 to - 2.00	1,313	7.7	12.3	25	1.9
6	- 1.99 to - 1.50	2,609	15.3	27.6	80	3.1
7	- 1.49 to - 1.00	3,700	21.7	49.3	164	4.4
8	- 0.99 to - 0.50	3,899	22.9	72.2	310	8.0
9	- 0.49 to 0.00	2,936	17.2	89.4	325	11.1
10	0.01 to 0.50	1,245	7.3	96.7	229	18.4
11	0.51 to 1.00	443	2.6	99.3	103	23.3
12	1.01 to 1.50	95	0.6	99.9	33	34.7
13	≥ 1.51	12	0.1	100.0	3	25.0

Note. *N* = 17,033; Physically aggressive/violent infraction base rate = 7.5%.

- 0.50) was roughly equivalent to the base rate of adjudication found across the sample. Bins 9 through 13 were associated with a higher probability of adjudication than the sample as a whole (i.e., higher than the base rate), with individuals whose scores placed them in one of the three highest bins having a probability of adjudication greater than three times the sample base rate.

An overall risk classification strategy was developed to allow for meaningful distinction between VRPS scores and probability bins that could be easily conveyed an understood in actual clinical practice.[5] Similar to the classification of risk and protective factors, overall risk categories were generated that reflected the probability of adjudication for a physically aggressive/violent infraction in relation to the sample-wide base rate. Probability bins 1 through 7, which included VRPS scores of ≤ 1.0 (for which probability of adjudication ranged from 0 to 4.4 %), were collapsed into one category that reflected *reduced risk* for adjudication compared to the general population. *Average risk* reflected VRPS scores for which the probability of adjudication was similar to the base rate of adjudication found for the entire sample. VRPS scores indicative of higher than average risk were categorized into two categories. *Moderately elevated risk*, which was reflective of probabilities of adjudication of 1.5 to 2 times the base rate. Finally, *markedly elevated risk* included VRPS scores that were associated with a probability of adjudication for a physically aggressive/violent infraction more than 3 times that of the base rate for the sample (see Table 53).

To test the validity of the four risk classification categories, a series of intergroup comparisons were completed. A one-way ANOVA was run to determine if mean yearly

[5] This risk classification system was intuitively created and based solely upon the current sample and associated base rate of adjudication. Thus, the appropriateness and generalizabilty of these categories across populations and base rates is unknown pending cross-validation efforts.

Table 53
Proposed Risk Classifications Associated with VRPS Score Ranges and Corresponding Base Rate of Adjudication for a Physically Aggressive/Violent Infraction

Score Range	Classification	% of Sample	Base Rate
$\leq$ - 1.0	Reduced Risk	49.3	3.3 %
- 0.99 to - 0.50	Average Risk	22.9	8.0 %
- 0.49 to 0.50	Moderately Elevated Risk	24.5	13.3 %
$\geq$ 0.51	Markedly Elevated Risk	3.2	25.3 %

Note. N = 17,033; physically aggressive/violent infraction base rate = 7.5%.

rates of adjudication for physically aggressive/violent infractions were significantly different depending on the risk category. In addition to a significant finding associated with differences in yearly rates across groups, significant posthoc analyses reflective of significant differences in yearly rates for each category in relation to other categories would be expected if risk classification categories were truly distinct. Likewise, the relationship between yearly rates of adjudication for each classification category and the mean yearly rate of adjudication would be expected to follow a similar pattern as previously found when examining base rates of adjudication (e.g., the mean yearly rate of adjudication for individuals classified as *average risk* would be similar to the yearly rate of adjudication for the entire sample).

Before the ANOVA was examined for significance, a Levene's test of homogeneity of variance was calculated, which suggested that the assumption of homogeneity of variance had been violated (F = 822.26, p < .001). As such, a more stringent alpha level was adopted to protect against Type I error (p < .01). Significant differences were found across risk classification categories (F[3,17029] = 246.39, $p <$ .001), which indicated that one or more significant differences existed between the four risk categories in yearly rates of adjudication of physically aggressive/violent infractions. To further examine these differences, posthoc analyses with *Tukey's HSD* were calculated that suggested significant differences in mean yearly rates of adjudication across all risk categories in relation to one another ($p < .001$).

Although not altogether surprising given the previously discussed relationship between yearly rates of adjudication and VRPS scores ($r = .20$, $p < .001$), the results of the ANOVA and post-hoc analyses supported risk categories as useful and distinct entities. In relation to the mean yearly rate of adjudication across the sample ($M = 0.071$, $SD =$ 0.29), violence risk categories fit remarkably well in the classification of yearly rates (see Table 54). Most notably, the mean yearly rate of adjudication for a physically aggressive/violent infraction among individuals classified as being of *average risk* ($M =$ 0.071, SD, 0.28) was identical to the average rate of adjudication found across the sample ($M = 0.071$, $SD = 0.29$). As with the base rates of adjudication for physically aggressive/violent infractions, mean yearly rates of adjudication for individuals classified as being of *moderately elevated risk* were nearly 1.75 times greater than the sample as a whole. A classification of *markedly elevated risk* was associated with a yearly rate of adjudication that was 4.5 times that of individuals classified as *average*.

VRPS Scores and Other Infraction Types

Although not specifically designed to forecast risk for other infraction types, given the previously identified positive relationship between yearly rates of adjudication across infraction types, in it was hypothesized that VRPS scores and the associated risk

Table 54
Mean Yearly Rate of Adjudication for Physically Aggressive/Violent Infractions According to Risk Classification Categories

Risk Category	*M*	*SD*
Reduced Risk	0.028 *	0.18
Average Risk	0.071 *	0.28
Moderately Elevated Risk	0.124 *	0.37
Markedly Elevated Risk	0.319 *	0.70

Note. N = 17,033; mean yearly rate of adjudication = 0.071 across sample.
* Significantly different yearly rate in relation to other categories (p < .001).

classification categories would be related to other infraction types. Indeed, VRPS scores were significantly correlated with yearly rates of adjudication for any infraction (r = .23, p < .001), verbally aggressive/defiant infractions (r = .17, p <.001), and nonaggressive/nonviolent infractions (r = .18, p < .001). Likewise, a series of point-biserial correlation coefficient calculations revealed a significant relationship between VRPS scores and whether or not an inmate was adjudicated for any infraction (r_{rb} = .21, p < .001), verbally aggressive/defiant infraction (r_{rb} = 20, p < ,001), and nonaggressive/nonviolent infractions (r_{rb} = .18, p < .001) after controlling for the variance associated with the number of days incarcerated.

A hierarchical binary logistic regression was computed to determine if VRPS scores significantly predicted adjudication for any institutional infraction after controlling for the amount of time served. The regression equation in the first step with only the control variable entered was a significant predictor of whether or not an individual had been adjudicated for a physically aggressive/violent infraction (X^2 [1, N = 17,033] =

160.43, $p < .001$). Likewise, the final model with VRPS score entered into the equation was a significant predictor of adjudication for any infraction (X^2 [2, N = 17,033] = 929.56, $p < .001$). Examination of the relative contribution of VRPS scores to the final regression equation revealed it to be a significant positive predictor ($b = .55$, *Wald* = 708.53, $p < .001$), such that as VRPS scores increased the likelihood that an individual was adjudicated for an institutional violation increased. Odds ratio analysis revealed that a VRPS score increase of 1 was associated with 1.74 times greater likelihood of adjudication for any infraction after controlling for the variance associated with time incarcerated.

Similar analyses demonstrated VRPS scores to be a significant predictor of adjudication for verbally aggressive/defiant infractions (X^2 [2, N = 17,033] = 699.97, $p < .001$) and nonaggressive/nonviolent infractions (X^2 [2, N = 17,033] = 602.05, $p < .001$) after controlling for time incarcerated. VRPS score was a significant positive predictor of adjudication for a verbally aggressive/defiant infraction ($b = .598$, *Wald* = 636.95, $p < .001$, *OR* = 1.82) and adjudication for a nonaggressive/nonviolent infraction ($b = .525$, *Wald* = 523.79, $p < .001$, *OR* = 1.69).

As can be seen in Table 55, when organized according to VRPS violence risk categories, the probabilities associated with adjudication for these infraction types followed a pattern similar to those found for physically aggressive/violent infractions. Individuals classified as being a *reduced risk* for violent behaviors displayed probabilities of adjudication that were lower than the base rate of adjudication for the sample as a whole. Likewise, individuals classified as being a *moderately elevated* or *markedly elevated risk* displayed probabilities of adjudication greater than the population base rate.

Table 55

Probability of Adjudication for Other Types of Infractions According to VRPS Risk Categories

VRPS Risk Classification	Infraction Category		
	Any	VA	NA
Base Rate	34.4 %	22.4 %	23.6 %
Reduced Risk	25.7 %	15.2 %	17.1 %
Average Risk	38.9 %	24.4 %	26.6 %
Moderately Elevated Risk	46.0%	33.0 %	32.4 %
Markedly Elevated Risk	47.3 %	35.5 %	34.7 %

Note. Reported base rate of adjudication is for entire sample (N = 17,054).

A one-way ANOVA was computed to explore whether yearly rates of adjudication for any infraction type differed depending on VRPS score risk classifications. Before the ANOVA was examined for significance, a Levene's test of homogeneity of variance was calculated, which suggested that the assumption of homogeneity of variance had been violated ($F = 479.01$, $p < .001$). As such, a more stringent alpha level was adopted to protect against Type I error ($p < .01$). Significant differences were found across risk classification categories ($F[3,17029] = 283.21$, $p < .001$), which indicated that one or more significant differences existed between the four risk categories in yearly rates of adjudication for any infraction. To further examine these differences, post-hoc analyses with *Tukey's HSD* were calculated that suggested significant differences in mean yearly rates of adjudication across all risk categories in relation to one another ($p < .001$). Individuals classified as being of *markedly elevated risk* for violent infractions on the basis of VRPS scores displayed the highest yearly rate of adjudication for any infraction (M = 2.17, SD = 4.59), which was more than twice the mean for sample as a whole (M = 0.83, SD = 1.96). As is demonstrated in Table 56, yearly rates of adjudication followed a similar pattern as found for adjudication for a physically aggressive/violent infraction, with individuals classified as being of *reduced risk* for violent infractions displaying the lowest rates of adjudication (M = 0.47, SD = 1.29).

Similar analyses were undertaken to examine differences across VRPS risk categories and adjudication for verbally aggressive/defiant and nonaggressive/nonviolent infractions. Similar to adjudication for any infraction, significant differences were found across VRPS categories and yearly rates of verbally aggressive/defiant ($F[3,17029]$ = 169.29, $p < .001$) and yearly rates of nonaggressive/nonviolent infractions $F[3,17029]$ = 166.04, $p < .001$). Likewise, post-hoc analyses revealed significant differences in mean yearly rates of adjudication across all risk categories in relation to one another ($p < .001$).

Simple Risk Score Method

Because the magnitude of regression coefficients tends to shrink substantially upon cross-validation (Cohen, 1990; Dawes & Corrigan, 1974; Gagliardi et al., 2004) a simple score violence risk prediction scale (hereafter referred to as the simple score method, or SSM) was developed. Regression coefficients obtained in the previous logistic regression (i.e., VRPS) were recoded according to the obtained direction of prediction and base rate of adjudication in comparison to the sample as a whole (as was demonstrated in Table 51). As can be seen in Table 57, a simple scoring scheme was undertaken in which protective factors were recoded as -1 (i.e., associated base rate of adjudication was less than the sample as a whole) and risk factors were recoded as +1

Table 56

Mean Yearly Rates of Adjudication for Any Infraction, Verbally Aggressive/Defiant Infraction, and Nonaggressive/Nonviolent Infractions According to VRPS Risk Classification

	Infraction Category					
	Any [a]		VA [b]		NA [c]	
VRPS Risk Classification	*M*	*SD*	*M*	*SD*	*M*	*SD*
Reduced Risk	0.47	1.29	0.22	0.91	0.22	0.61
Average Risk	0.87	1.79	0.43	1.27	0.37	0.39
Moderately Elevated Risk	1.33	2.41	0.68	1.70	0.53	1.01
Markedly Elevated Risk	2.17	4.59	1.23	3.59	1.22	0.52

Note. N = 17,033. VA = Verbally Aggressive/Defiant; NA = Nonaggressive/Nonviolent.
[a] M = 0.83, SD = 1.29; [b] M = 0.41, SD = 1.40; [c] M = 0.34, SD = 0.80.

Table 57

Simple Risk Method Score Conversion Values and Associated Rates of Adjudication for a Physically Aggressive/Violent Infraction

Variable	Value	Recoded Score	Rate of Adjudication
Age			
	< 21	2	15.1 %
	21 to 25	1	11.1 %
	26 to 30	0	8.1 %
	> 30	- 1	4.7 %
Gender			
	Female	1	3.9 %
	Male	0	8.0 %
Gang Affiliation			
	Yes	2	19.0 %
	No	- 1	6.4 %
Prior Incarceration			
	Yes	1	8.5 %
	No	0	6.7 %
Person Crime			
	Yes	- 1	6.5 %
	No	0	8.4 %
PAI Validity			
	Valid	0	7.3 %
	Invalid	1	8.9 %
AGG [a]			
	≤ 49	- 1	5.3 %
	50 to 59	0	8.4 %
	≥ 60	1	11.2 %
BOR [a]			
	≤ 44	- 1	5.8 %
	45 to 69	0	7.5 %
	≥ 70	1	8.7 %

Note. *N* = 17,033. Base rate of adjudication for a physically aggressive/violent infraction = 7.5%.
[a] Valid profiles only (n = 14,658).

(i.e., associated base rate of adjudication was greater than the sample as a whole). Variables associated with a similar base rate of adjudication as the entire sample were coded as 0. In addition, both the youngest age group (i.e., < 21) and gang affiliate status were coded as 2 in order to reflect base rates of adjudication that were more than two times that demonstrated by the sample as a whole. Because DRG score cutoffs did not identify groups that displayed adjudication levels significantly above or below the sample base rate, DRG was not included as a variable in the SSM. Finally, a score of 1 was added to the total score so as to ensure a simple interpretive strategy in which a SSM total score of 0 was reflective of average risk (i.e., base rate of adjudication similar to that of the entire population), with positive and negative scores representing increased and decreased risk respectively. This scoring system resulted in potential minimum and maximum scores of -5 and 9, respectively.

Actual SSM scores ranged from -5 to 9, with a mean score of -0.07 and a median score of 0. A significant positive relationship was found between SSM scores and yearly rates of adjudication for physically aggressive/violent infractions, such that higher scores were associated with a greater rate of adjudication ($r = .19$, $p < .001$). As can be seen in Table 58, the probabilities associated with SSM scores followed a similar pattern as those demonstrated for VRPS scores. Negative scores were associated with a base rate of adjudication for physically aggressive/violent infractions lower than the sample-wide base rate of adjudication. A score of zero was classified as being of *average risk*, displaying a base rate of adjudication of 6.9 %. Positive scores were associated with a greater likelihood of adjudication, with scores greater than 3 displaying base rates of adjudication more than two times that of the sample as a whole (see Table 59).

Table 58

Frequency and Base Rates of Adjudication for a Physically Aggressive/Violent Infraction Associated with Simple Score Method Prediction Scheme Scores

Score	*n*	%	Cumulative %	Adjudicated *n*	Adjudicated %
- 5	10	0.1	0.1	0	0
- 4	454	2.7	2.8	4	0.9
- 3	1,690	9.9	12.7	31	1.8
- 2	2,568	15.1	27.8	92	3.6
- 1	3,223	18.9	46.7	147	4.6
0	3,107	18.2	64.9	213	6.9
1	2,332	13.7	78.6	224	9.6
2	1,505	8.8	87.4	185	12.3
3	931	5.5	92.9	133	14.3
4	552	3.2	96.1	105	19.0
5	326	1.9	98.0	66	20.2
6	212	1.2	99.2	48	22.6
7	106	0.6	99.8	26	24.5
8	14	0.1	99.9	3	21.4
9	3	< .01	100.0	1	33.3

Note. *N* = 17,033; Physically aggressive/violent infraction base rate = 7.5%.

Table 59
Simple Score Method Risk Classification

Score Range	Classification	% of Sample	Base Rate
- 5 to -1	Reduced Risk	46.6	3.4
0	Average Risk	18.2	6.9
1 to 4	Moderately Elevated Risk	28.0	11.4
5 to 9	Markedly Elevated Risk	7.1	20.5

Note. N = 17,033; physically aggressive/violent infraction base rate = 7.5%.

An ROC analysis was undertaken to examine the predictive accuracy of the SSM in the prediction of adjudication for a physically aggressive/violent infraction independent of base rate. The SSM was found to be a significant predictor of adjudication for a physically aggressive/violent infraction (AUC = .695, SE = .007, p < .001), demonstrating a medium effect size that was equivalent to a Cohen's d of .721; Rice & Harris, 2005).

Predictive Accuracy of Simple Score and Regression-Based Methods

In order to compare the predictive accuracy of the simple risk score method (SSM) and the regression-based method (i.e., VRPS), three additional statistical calculations were employed: (a) a hierarchical linear regression to examine the amount of unique variance attributable to each method in the prediction of adjudication for a physically aggressive/violent infraction after controlling for the variance associated with time served, (b) a hierarchical linear regression to examine the amount of unique variance attributable to each method in the prediction of yearly rates of physically aggressive/violent infractions, and (c) a test of the difference in AUC sizes associated with each method.

A backwards elimination hierarchical linear regression was calculated to determine if SSM scores predicted whether or not an inmate was adjudicated for a physically aggressive/violent infraction after controlling for time served and the variance associated with VRPS scores. Although primarily exploratory in nature, it was hypothesized that removal of VRPS scores would result in a nonsignificant finding, which would be indicative of similar predictive accuracy across methods. Whether or not an inmate was adjudicated for a physically aggressive/violent infraction served as the dependent variable in each analysis, which was regressed in three steps. In the first step, the number of days incarcerated was entered to determine how much variance it accounted for. VRPS and SSM scores were entered in the second step to determine how much variance was accounted for by both prediction methods. Finally, VRPS scores were removed in the third step, leaving only the variance associated with SSM scores after controlling for time served.

The regression equation in the first step with time served entered was a significant predictor of whether or not an inmate was adjudicated for a physically aggressive/violent infraction (F[1,17031] = 10.31, p = .001). Likewise, the second step with both prediction methods entered was also a significant predictor of adjudication (F[3,17029] = 264.04, p < .001), accounting for 4.4 % of the variance in adjudication (R= .201, R^2 = .044). The final model with VRPS scores removed was a significant predictor of adjudication (F[2,17030] = 329.22, p < .001) and accounted for 3.7 % of the variance in adjudication (r = .193, r^2 = .037). Although SSM score was a significant predictor of whether or not an individual was adjudicated for a physically aggressive infraction after controlling for time incarcerated, the removal of VRPS scores resulted in decreased predictive accuracy (ΔR^2 = - .007) and was indicative of incremental validity of VRPS. A similar procedure with SSM score removed in the last step was also significant (F[2,17030] = 371.87, p < .001; see Table 60). Analysis of the variance accounted for by VRPS after removal of SSM scores further suggested unique variance in the prediction of adjudication associated with SSM scores (R = .205, R^2 = .042, ΔR^2 = - .002). Thus, after controlling for the variance associated with time incarcerated, both prediction methods added unique variance to the prediction of adjudication for a physically aggressive/violent infraction. Likewise, though small, differences in predictive accuracy were noted between methods, with VRPS demonstrating slightly greater accuracy than SSM after controlling for the number of days incarcerated.

A hierarchical linear regression was calculated to determine if the equation method added incremental validity in the prediction of yearly rate of adjudication for physically aggressive/violent infractions above the variance attributed to the simple score method. It was hypothesized that the two methods of prediction were equally accurate and that therefore the equation model would not add variance to the prediction of yearly rates of adjudication. Yearly rates of adjudication were regressed in two steps. SSM scores were entered in the first step to determine how much variance they accounted for. VRPS scores were entered in the second step to determine if they added variance to the prediction of yearly adjudication rates. The regression equation in the first step was significant (F[1,17031] = 629.46, p < .001), and indicated that SSM scores accounted for 3.6 % of the variance in yearly rates of adjudication for physically aggressive infractions

Table 60

Results of Hierarchical Regression Analyses: Incremental Validity of Equation and Simple Score Methods in the Prediction of Adjudication for a Physically Aggressive/Violent Infraction After Controlling for Time Incarcerated

	R	R^2	ΔR^2	p
Step 1	.025	.001	---	.001
Time Incarcerated				
Step 2	.211	.044	+ .043	< .001
Equation Method (VRPS)				
Simple Score Method (SSM)				
Step 3 [a]	.205	.042	- .002	< .001
Equation Method (VRPS)				
Step 3 [b]	.183	.037	- .007	< .001
Simple Score Method (SSM)				

Note. Both regression equations produced identical Steps 1 and 2.
[a] Simple score method (SSM) removed from equation in Step 3.
[b] Equation method (VRPS) removed from regression equation in Step 3.

(R = .19, R^2 = .036). Likewise the second step with VRPS scores added to the equation was significant (F[2,17030] = 367.52, p < .001) and resulted in a 0.5 % increase in the variance accounted for by the model (R = .203, R^2 = .041, ΔR^2 = .005). Thus, VRPS scores added incremental validity over SSM scores in the prediction of yearly rates of adjudication for physically aggressive/violent infractions.

A similar regression analysis was undertaken to examine whether SSM scores added incremental validity over VRPS scores in the prediction of yearly rates of adjudication for physically aggressive/violent infractions. VRPS scores were added in the first step, which was found to be a significant prediction of adjudication rates (F[1,17031] = 675.45, $p < .001$), accounting for 3.8 % of the variance associated with yearly rates of adjudication ($R = .195$, $R^2 = .038$). SSM scores were added in the second step, and as before, resulted in significant finding (F[2,17030] = 367.52, $p < .001$). The addition of SSM scores resulted in a 0.3% increase in the variance accounted for by the model ($R = .203$, $R^2 = .041$, $\Delta R^2 = .03$). Thus, SSM scores added incremental validity over VRPS scores in the prediction of yearly rates of adjudication for physically aggressive/violent infractions.

To test for meaningful differences in the size of *AUC* for each method in the prediction of adjudication for a physically aggressive/violent infraction, a *critical ratio z score* was calculated using the method recommended by Hanley and McNeil (1983) for comparing *AUC*s derived from the same sample. According to this method, z scores $\pm$ 1.96 are considered indicative of a true difference between *AUC*s (i.e., $p \leq .05$). A significant difference in the predictive accuracy for the prediction of adjudication was found between prediction methods ($z = 2.23$, $p = .026$), such that the equation method evidence a significantly larger *AUC* (*AUC* = .715, *SE* = .007, $p < .001$, *CI*[95%] = .701 - .729) when compared to the simple score method (*AUC* = .695, *SE* = .007, $p < .001$, *CI*[95%] = .680 - .709). Although the nature of difference in predictive accuracy was small, as evidenced by overlapping 95% confidence intervals, these results indicated prediction with the VRPS to be more accurate in the prediction of adjudication for a physically aggressive/violent infraction than the SSM (see Figure 10).

Taken together, although only small differences in predictive accuracy were noted between the equation and simple score methods, the hypothesis that the two methods of

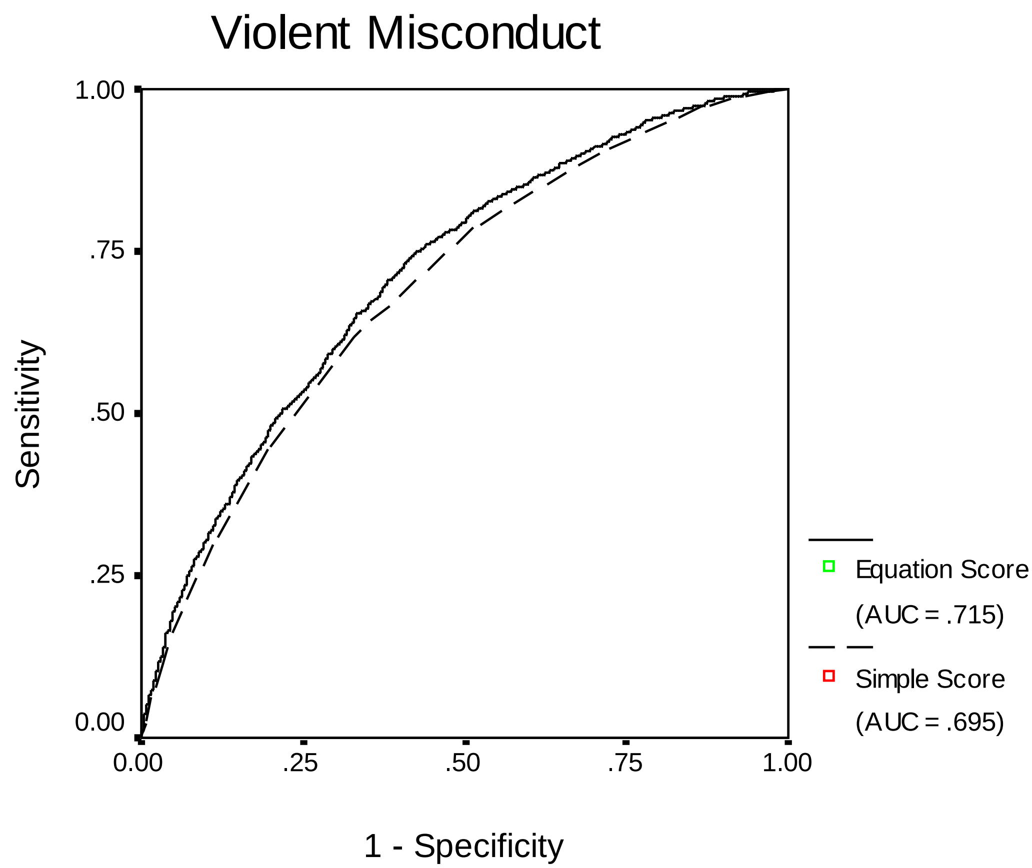


Figure 10. ROC curves for equation score method (VRPS) and simple score method (SSM) in the prediction of adjudication for a physically aggressive/violent institutional infraction.

prediction would demonstrate equal accuracy in the prediction of adjudication for a physically aggressive/violent infraction was not supported by the data. Both prediction methods added unique variance to the prediction of adjudication, with the equation method adding greater variance. A similar pattern was found when considering yearly rates of adjudication for physically aggressive infractions, with both methods adding incremental validity. The equation model also demonstrated significantly greater predictive accuracy than the simple score method when comparing *AUC*s, although both methods produced robust effect sizes.

These findings may be the result of one or more factors: the large sample size relative to the number of predictors, correlation suppression, or a high degree of variability in beta weights relative to their mean (Cohen, 1990). Likewise, it is possible that the removal of DRG as a predictor in the SSM decreased its overall accuracy in comparison to the VRPS. Nonetheless, given the likely shrinkage of individual regression coefficients associated with the equation model and the small differences in predictive accuracy noted between methods, the simple score method may prove to be the more accurate method upon cross-validation. Although smaller than the equation model, the predictive accuracy of the simple score method remained robust with the current sample. Thus, the practical advantages of the SSM (i.e., ease of scoring and interpretation) in comparison to the equation model may in fact outweigh the loss of a small amount of predictive accuracy. Future research is necessary to test such hypotheses.

Incremental Predictive Accuracy

Incremental Predictive Accuracy of PAI Variables

To test the hypothesis that these VRPS variables related to the PAI would add incremental validity to the prediction of adjudication for a physically aggressive/violent infractions above that obtained by historical/demographic variables alone, the VRPS was split into two subscales The first subscale was composed of the following five demographic/historical variables: age, gender, gang affiliation, prior incarceration, and person crime index offense. The second subscale included only those variables associated with the PAI: AGG, BOR, DRG, and overall PAI validity. Both subscales were significant predictors of adjudication of for a physically aggressive/violent infraction, with the demographic/historical subscale (*AUC* = .697, *SE* = .008, $p < .001$) displaying significantly greater predictive accuracy in comparison to the PAI-related subscale (*AUC* = .618, *SE* = .008, $p < .001$; $z = 7.49$, $p < .001$; see Figure 11). Nonetheless, given the overall *AUC* for the VPRS (.715), the combination of historical/demographic and PAI-related variables resulted in the greatest predictive accuracy.

A hierarchical linear regression was calculated to determine if VRPS PAI-related variables added incremental validity to the prediction of adjudication for physically aggressive/violent infractions above the variance attributed to VRPS historical and demographic variables after controlling for the variance associated with time incarcerated. Adjudication was regressed in three steps. The number of days incarcerated was entered in the first step and was found to be a significant predictor of adjudication (F[1,17032] = 10.31, $p = .001$). The VRPS historical/demographic subscale was entered in the second step and resulted in a significant finding (F[2,17032] = 299.91, $p < .001$), accounting for 3.4 % of the variance in adjudication ($R = .184$, $R^2 = .034$). The PAI-related subscale was entered in the final step and produced a significant model of prediction (F[3,17032] = 250.35, $p < .001$). The addition of the PAI-related subscale increased the variance accounted for in the prediction of adjudication by 0.8% ($R = .206$, $R^2 = .042$, $\Delta R^2 = .008$). Although displaying smaller predictive accuracy, the PAI-related subscale added incremental validity above that obtained by historical and demographic variables alone in the prediction of adjudication for a physically aggressive/violent infraction, thus providing support for the inclusion of the PAI in the VRPS and the use of self-report information to forecast risk for violence.

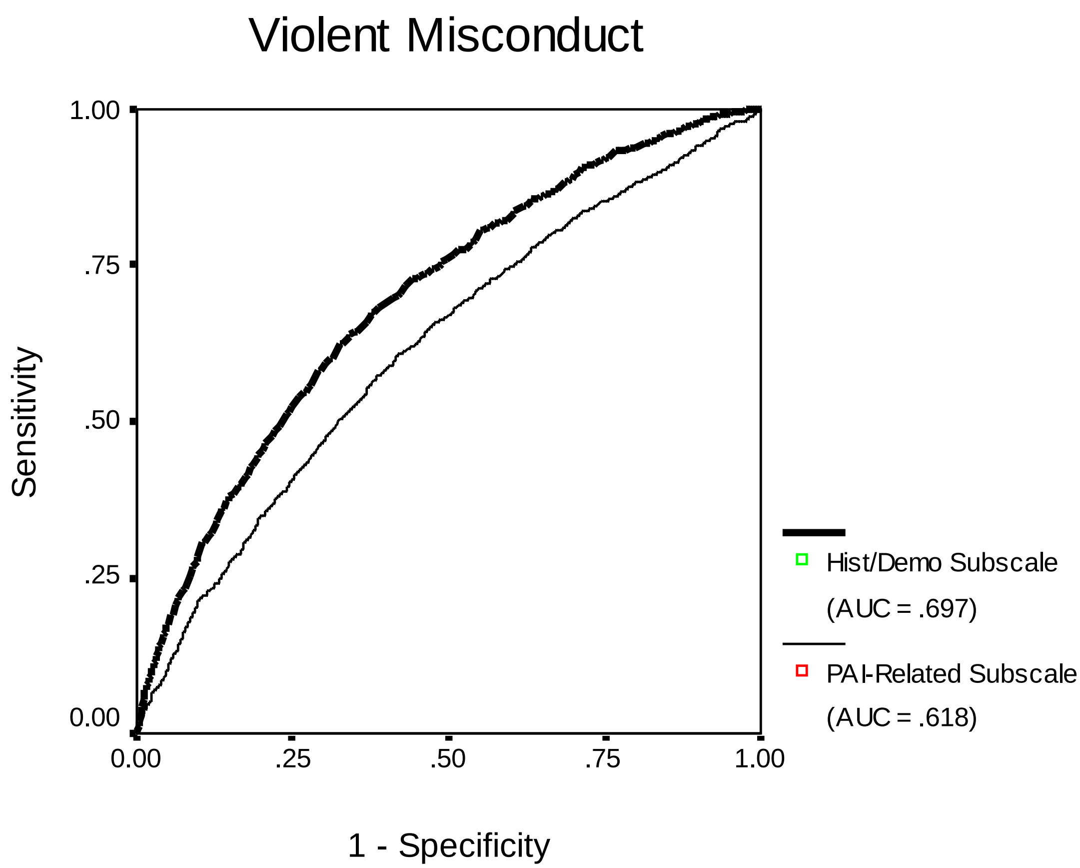


Figure 11. ROC curves for VRPS historical/demographic and PAI-related subscales in the prediction of adjudication for a physically aggressive/violent institutional infraction.

Incremental Predictive Accuracy of Dynamic Predictors Beyond Static Predictors

To test the hypothesis that individual VRPS variables identified as dynamic (i.e., changeable) in nature would add incremental validity and accuracy to the prediction of adjudication for a physically aggressive/violent infraction above that obtained by static variables alone, the VRPS was split into two subscales. The first subscale was composed of the following four static variables: age, gender, person crime index offense, and prior incarceration. The second subscale was made up of variables reflecting dynamic factors:

AGG (aggressive attitudes and behaviors), BOR (impulsivity, affective lability/instability, poorly controlled anger), DRG (drug problems), PAI validity (defensiveness), and gang affiliation. Both subscales were significant moderate predictors of adjudication for a physically aggressive/violent infraction, with the static factors subscale (*AUC* = .682, *SE* = .007, $p < .001$) displaying significantly greater predictive accuracy in comparison to the dynamic factors subscale (*AUC* = .653, *SE* = .008, $p < .001$; $z = 4.84$, $p < .001$; see Figure 12). Nonetheless, given the *AUC* for the VPRS (.715), the combination of static and dynamic variables resulted in the greatest predictive accuracy.

A hierarchical linear regression was calculated to determine if VRPS dynamic variables added incremental validity to the prediction of adjudication for physically aggressive/violent infractions above the variance attributed to static variables after controlling for the variance associated with time incarcerated. Adjudication was regressed in three steps. The number of days incarcerated was entered in the first step and was found to be a significant predictor of adjudication ($F[1,17032] = 10.30$, $p = .001$). The subscale made up of VRPS static variables was entered in the second step, resulting in a significant finding ($F[2,17033] = 241.13$, $p < .001$) and accounting for 2.8% of the variance in adjudication ($R = .166$, $R^2 = .028$). The subscale made up of VRPS dynamic variables was entered in the final step and resulted in a significant model of prediction ($F[3,17032] = 258.99$, $p < .001$). The addition of dynamic factors increased the variance accounted for in the prediction of adjudication of a physically aggressive/violent infraction by 1.6% ($R = .209$, $R^2 = .044$, $\Delta R^2 = .016$). Examination of the relative contribution of each subscale in the final model revealed both static ($\beta = .144$, $p < .001$)

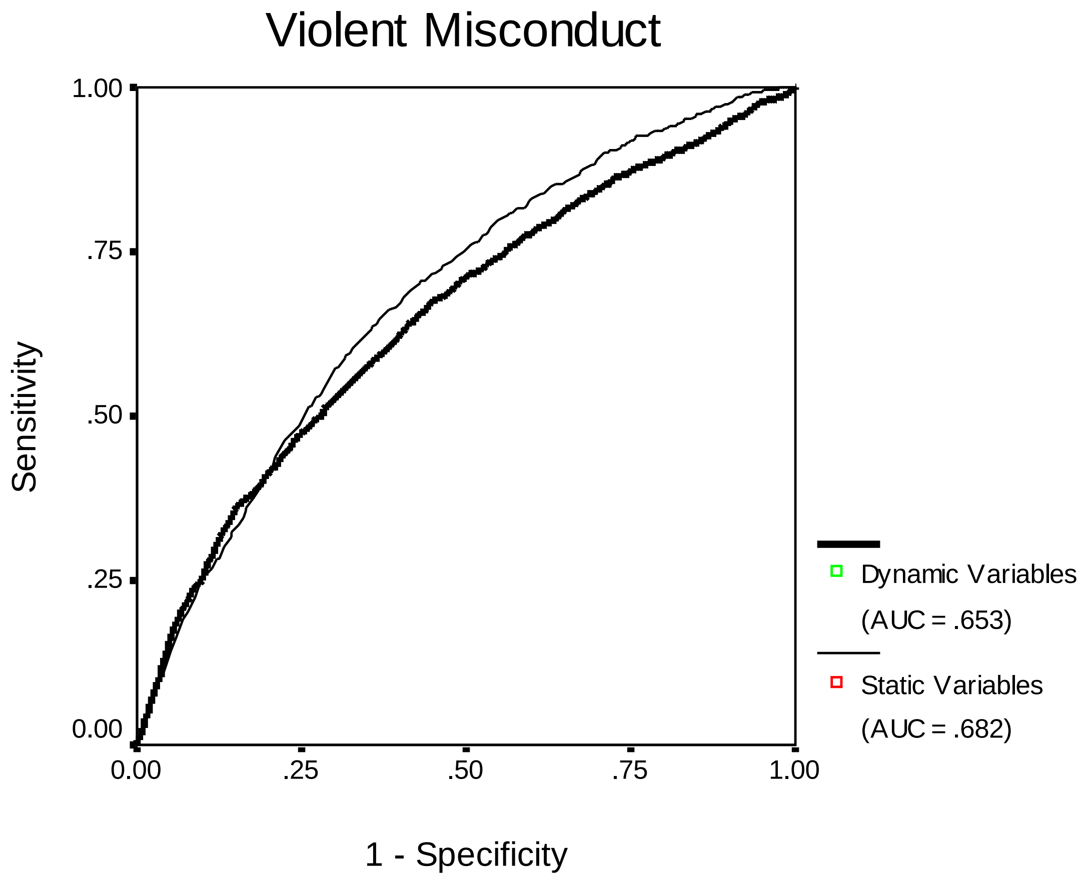


Figure 12. ROC curves for VRPS static and dynamic variables in the prediction of adjudication for a physically aggressive/violent institutional infraction.

and dynamic (β = .129, p < .001) variables to be significant positive predictors of adjudication for a physically aggressive/violent infraction after controlling for the variance associated with time incarcerated. Thus, although VPRS static variables were more accurate in the prediction of adjudication and accounted for a greater proportion of variance, the addition of dynamic factors improved prediction above that obtained by static variables.

DISCUSSION

This research represented a large scale exploratory prospective examination of the ability of several static and dynamic variables to forecast risk for violent and disruptive behavior among incarcerated adult offenders. The purpose of this effort was to extend the research regarding empirical correlates of problematic institutional behaviors with a diverse sample of newly incarcerated offenders; of particular interest was the utility of the PAI, a popular multiscale self-report personality inventory that is often employed for correctional classification and mental health screening purposes. Following the examination of univariate predictors of institutional misconduct, a multivariable institutional violence prediction scheme was developed and tested. Finally, general personality patterns and psychopathology levels of this sample as assessed by the PAI were examined so as to inform correctional mental health treatment and policy.

In the following section, I summarize the results of this study and discuss the implication of major findings, paying special attention to bridge results to previous research findings. In order to facilitate a coherent and concise consolidation of the main aspects of this work, discussion points are organized according to the three main domains of investigation: (a) univariate predictors of institutional misconduct and violence, (b) utility of the VRPS in the prediction of institutional violence, and (c) personality functioning of newly incarcerated offenders. Following discussion of general conclusions regarding each domain, the strengths and limitations of this study are identified and recommendations for future research are made.

Univariate Predictors of Institutional Misconduct and Violence

Utility of the PAI in the Prediction of Violent and Disruptive Behaviors

Several PAI validity, clinical, and treatment scales were significant predictors of adjudication for each category of infraction, the majority of which remained significant after controlling for time incarcerated, age, gang affiliation, gender, and previous incarceration status. Interestingly, the strongest associations were demonstrated for the prediction of adjudication for a physically aggressive/violent infraction, despite this infraction category demonstrating the lowest base rate of adjudication among outcome categories. That is, regardless of scale content and across infraction categories, the PAI was most accurate when forecasting risk of violent behaviors. However, the predictive utility of individual PAI scales varied according to the construct and infraction category under investigation (see Appendix B for the base rate of institutional violations according to PAI scale score ranges and related categories [e.g., potential major mental illness]).

PAI validity. Previous researchers have demonstrated defensive responding styles on self-report personality measures to be associated with increased risk for problematic institutional behaviors (Edens & Ruiz, 2005; 2006) and criminal and violent recidivism (Mills et al., 2003). When examining overall PAI interpretability as defined by Morey (2003), an invalid PAI in the current study was associated with significantly higher yearly rates of adjudication for physically aggressive, verbally aggressive/defiant, and general institutional violations. However, in terms of prospective prediction, an invalid PAI was only significantly predictive of adjudication for a physically aggressive/violent infraction, with individuals who produced an invalid profile evidencing a 25% greater likelihood of physically aggressive behaviors than those who produced valid profiles.

Because a PAI may be deemed uninterpretable for a variety of reasons (e.g., impression management, careless/random responding, inconsistent response patterns), it was possible that a dichotomous validity decision composed of all four validity indexes masked differential outcomes based on response styles and individual validity scales. Indeed, INF (i.e., careless/random responding) displayed the most consistent association with adjudication, having positive associations with all infraction categories after controlling for time served and demographic variables. The relationships of PIM and NIM with adjudication for general infractions were opposite in direction, which was unsurprising given that they were designed to measure theoretically opposite constructs. Attempts at positive impression management were associated with an increased likelihood of problematic behaviors, whereas attempts at negative impression management resulted in decreased likelihood of general institutional violations; however, neither impression management index was significantly predictive of adjudication for physically aggressive/violent infractions. Thus, among validity scales, only those scales associated with random, careless, and inconsistent responding were predictive of adjudication for physically violent behaviors after controlling for time served and other demographic variables, with INF displaying the strongest predictive power across validity scales.

Content-relevant scales. Consistent with Walters's (2006b) contention that self-report measures designed to assess forensic/correctional populations (i.e., content-relevant scales) tend to outperform other self-report measures when appraising risk, those

PAI scales designed to measure traits associated with criminal justice outcomes, namely antisocial practices and beliefs (ANT), aggression (AGG), and potential for violent behavior (VPI), were the strongest individual predictors of adjudication for physically aggressive/violent infractions among PAI scales. In fact, ANT displayed the greatest predictive accuracy across scales in the prediction of each category of infraction, with effect sizes approaching the moderate range in regard to physical aggression (*AUC* = .614). Such results are consistent with previous research in which ANT scores were positively associated with institutional infractions among subgroups of incarcerated offender (Caperton et al., 2004; Edens & Ruiz, 2005, 2006; Walters et al., 2003; Wang & Diamond, 1999). However, the strength of association between ANT and institutional misconduct in the current study was smaller than in some of the aforementioned studies. This finding may reflect several factors unique to the current study, including its prospective nature, a shorter follow-up period than some prior investigations, the examination of general population offenders (i.e., non-extreme groupings), a lower base rate of violent infractions, and a more focused definition of institutional misconduct (i.e., specific infraction categories rather than a nonspecific category of all infraction types).

AGG performed similarly well in the prediction of physically aggressive/violent infractions (*AUC* = .608), even surpassing ANT as the strongest individual predictor of physically violent infractions among PAI scales after controlling for time served and demographic variables (*b* = .019). Likewise, providing support for the construct validity of this scale, AGG was a significant positive predictor of adjudication for verbally aggressive/defiant infractions, but it performed less well in the prediction of nonaggressive infractions. Similarly, the VPI displayed a robust association with physical aggression, though lower in magnitude than the associations of ANT and AGG with physical aggression (*AUC* = .576). Its utility as a predictor of other infraction types was limited; for example, it was not a significant predictor of adjudication for nonaggressive/nonviolent infractions. However, given that the VPI was designed to assess risk for physically violent behaviors (Morey, 1996), the lack of association with nonviolent offenses provided evidence of divergent validity.

Although not designed specifically to predict violent and antisocial behaviors per se, DOM was designed to assess interpersonal traits that have been associated with increased risk for interpersonal violence (e.g., Malik & Linahl, 1998). In this study, it was hypothesized that the greater the degree to which a subject reported a desire to control relationships, the greater the likelihood that the individual would demonstrate problematic institutional behaviors. As hypothesized, DOM was a significant positive predictor of all categories of infraction, demonstrating accuracy equivalent to the VPI in the prediction of adjudication for physically aggressive/violent infractions.

Major mental illness. Researchers have demonstrated that incarcerated individuals with serious and persistent mental illnesses pose a greater risk for institutional violations than incarcerated individuals with no identified mental health problems (Adams, 1983, 1986; Baskin et al., 1991; McShane, 1989; Morgan et al., 1993; Toch & Adams, 1986, 2002; Toch et al., 1987; Warren, Hurt, et al., 2002). Four PAI clinical scales designed to assess symptomatology consistent with major mental illness (MAN, PAR, SCZ, and BOR) allowed for empirical examination of the hypothesis that scales associated with major mental illnesses would predict problematic institutional behaviors. Among these scales, MAN (Mania) displayed the most robust associations with institutional misconduct, demonstrating positive relationships with all infraction categories except nonaggressive types. Conversely, schizophrenia-spectrum symptomatology, as measured by SCZ, was not significantly associated with verbal or physical aggression and was actually a negative predictor of general misconduct and nonaggressive infractions. Thus, to the degree that SCZ accurately measures intensity of schizophrenia-spectrum symptomatology, greater frequency and intensity of symptoms was associated with a lower likelihood of adjudication for institutional misconduct in general.

Although PAR (Paranoia) elevations were initially associated with increased likelihood of general, physically aggressive, and verbally aggressive infractions, only the small relationship between PAR scores and verbally aggressive/defiant infractions remained significant after controlling for age, gender, ethnicity, prior incarcerations, and gang affiliation. That is, after controlling for demographic factors, increased levels of hypervigilance, suspiciousness, persecutor beliefs, and resentment were only associated with a slightly greater likelihood of adjudication for a verbally aggressive/defiant infraction and were unrelated to physically aggressive behavior. Though not conclusive, this finding is supportive of previous authors who have described the higher rates of institutional infractions among mentally ill inmates to be reflective of symptomatic behaviors, such as vulgar language, yelling, refusing orders, and creating disturbances (Adams, 1986; McShane 1989).

Examination of the relationship between symptoms of major mental illness as measured by the PAI (i.e., MAN, PAR, SCZ, and BOR) and future violent institutional behaviors resulted in differential findings across scales, with BOR and MAN each displaying a positive association with physically aggressive behaviors and SCZ and PAR showing no significant association with physically aggressive behaviors. However, when considering individuals with active serious symptomatology as evidenced by marked elevations on one or more of these scales (i.e. potential major mental illness; Morey, 2003), a more consistent picture emerged. Classification as potentially seriously mentally ill on the basis of marked PAI scale elevations was a significant positive predictor of both physical violence and verbal aggression, with such individuals demonstrating significantly greater yearly rates of physically aggressive infractions when compared to subjects without marked scale elevations. Thus, although individual PAI scale fluctuations suggested differential relationships between various psychiatric symptom clusters and future aggressive behaviors, congruent with previous research with incarcerated populations the presence of marked psychiatric symptomatology in general was a significant risk factor for violent and verbally aggressive institutional behaviors.

PAI subscales. Ten PAI scales are composed of individual subscales that assess specific aspects of a clinical construct. Because certain subscales may be more related to institutional infractions than is the scale itself, questions were raised regarding the ability of PAI subscales to add practical incremental validity to the prediction of institutional infractions beyond that obtained by the corresponding major scale. However, the obtained biserial correlations between PAI subscales and yearly rates of adjudication for each category of infraction were generally not greater than those demonstrated for their corresponding major scale. In the rare cases in which a subscale displayed a greater relationship with rates of adjudication than its corresponding major scales (9% across all subscale comparisons), the differences was minimal and did not appear to add practical incremental utility in the prediction of problematic institutional behaviors. Thus, the hypothesis that the use of PAI subscales would result in practical incremental validity was not supported by the data.

As previously noted, Kroner and Mills (2001) identified three criteria on which to evaluate classification/prediction systems in forensic settings: (a) predictive accuracy, (b) ability to provide other important information for policy making and population management, and (c) cost and ease. When evaluated according to these criteria, the PAI appears to be a promising tool for forecasting risk in correctional settings. Several individual scales were significant predictors of institutional misconduct, with the strongest associations being demonstrated in the prediction of future violent behaviors. In particular, those scales identified as content-relevant (ANT and AGG) maintained the strongest associations with future physically aggressive behaviors after controlling for demographic factors, and demonstrated robust accuracy independent of base rate. In terms of providing additional information over and above information generally available upon inmate arrival to a correctional system, the multiscale design of the PAI provides a multitude of information about personality and psychopathology of potential use to correctional administrators, clinicians, and policy makers. Most notably, the PAI has a steadily growing research base that supports its use for psychiatric diagnosis, personality assessment, and treatment planning with a wide variety of populations. Finally, given that the PAI is a self-report, paper-and-pencil measure that can be administered in a group format and scored electronically, it provides an efficient and cost-effective method of estimating risk and assessing psychopathology of an ever steady influx of newly incarcerated offenders.

Utility of Demographic Variables in the Prediction of Violent and Disruptive Behaviors

Consistent with research that has unequivocally demonstrated age to be among the most robust predictors of future violent and antisocial behaviors across contexts (Cunningham & Reidy, 1998b; Gendreau et al., 1996; Hirschi & Gottfredson, 1983; Monahan et al., 2001; Quinsey et al., 2006; Swanson et al., 1990), including correctional settings (Baskins et al., 1991; Cooper & Werner, 1990; Cunningham & Reidy, 1998b; Loza, 2003; Proctor, 1994; Sorensen & Wrinkle, 1996; Walters, 1998; Warren, Hurt, et al., 2002), subject age in the current study was strongly related to problematic institutional behaviors. Subject age was negatively associated with yearly rates of all infraction categories, such that younger ages were associated with higher rates of violent and disruptive behaviors. Likewise, age was a significant negative predictor of adjudication for each infraction type, with younger subjects displaying a markedly increased likelihood of adjudication. Of note, the effect of age on problematic behaviors was greatest for future violent behaviors. A similar pattern was found for gender, with male subjects demonstrating greater yearly rates, base rates, and likelihood of adjudication for all infraction categories when compared to female subjects.

A common axiom in the behavioral sciences is that past behavior is the best predictor of future behavior; however, when considering only those behaviors that resulted in incarceration and aggressive infractions, the opposite pattern was demonstrated. Incarceration for a crime against a person was associated with decreased likelihood of adjudication for each category of infraction. Most notably, a significant negative relationship was found between a person index offense and violent infractions, with subjects incarcerated for crimes other than person crimes demonstrating more than twice the likelihood of adjudication for a violent infraction than subjects incarcerated for person offenses. In fact, incarceration for a property crime was a significant predictor of adjudication for physically aggressive, verbally aggressive/defiant, and nonaggressive institutional violations. Likewise, though related to problematic institutional behaviors to a smaller degree than property offenses, incarceration for a statutory offense was positively associated with adjudication for general, verbally aggressive, and nonaggressive infractions.

Although potentially counterintuitive given the well-established positive relationship between past and future violence in the community (McNeil, 1998, Monahan et al., 2001; Pinard & Pagani, 2001), this research adds to a growing body of literature that has demonstrated that individuals who are incarcerated for violent offenses are at least no more likely to commit violent institutional infractions than are those in the general population of incarcerated offenders (Cunningham et al., 2005; Flanagan, 1983; Proctor, 1994; Toch & Adams, 2002). Such findings have serious implications, given that potential for violence while incarcerated is an aggravating/mitigating factor for consideration in death penalty hearings in several jurisdictions (Cunningham & Reidy, 1998b; Edens 2001).

Despite anecdotal evidence and a handful of empirical investigations that have strongly suggested that individuals associated with prison and street gangs are at an increased risk for problematic institutional behaviors (Fischer 2001; Fong & Vogel, 1995; Gaes et al., 2002), researchers have generally failed to consider the impact of gang affiliation when investigating institutional adjustment and misconduct. The results of this study highlight the importance of considering gang affiliation when investigating institutional misbehavior in correctional settings, particularly future violent offending. Individuals classified as gang affiliates demonstrated significantly greater yearly rates of all infraction types than individuals with no identified gang affiliation, and gang-affiliation status was a robust predictor of adjudication for all infraction categories. In fact, gang-affiliation status rivaled age as the greatest single predictor of institutional violence, with gang-affiliated subjects demonstrating a likelihood of adjudication for violent behaviors that was 3.5 times greater than was the likelihood for subjects not identified as having a gang affiliation. Gang affiliates were responsible for more than one-quarter of all violent infractions, which was more than 3 times what would have been expected based solely on the base rate of individuals identified as gang affiliates. Although gang-affiliation status was associated with a greater likelihood of adjudication for other infraction types, the strength of association was not as strong as was obtained for violent infractions.

Although the number of previous incarcerations was only weakly related to yearly rates of general and nonaggressive infractions, having been incarcerated on at least one previous occasion was associated with a greater likelihood of adjudication for all categories of infractions when compared to subjects who had not previously been incarcerated. Thus, on the basis of adjudicated institutional violations, there was no evidence to support the contention that individuals who have been previously incarcerated demonstrate easier adjustment to incarceration when compared to first time offenders. In fact, from an institutional management perspective, individuals with no prior incarcerations appear to have been less of a problem to correctional staff than those with prior prison experience.

Taken together, the examination of univariate predictors of institutional violence resulted in an archetypal high-risk inmate. Such an individual is a young, male, repeat offender, who has a history of aggressive and antisocial behaviors and attitudes, exhibits untreated psychiatric symptomatology, is affiliated with antisocial groups, and is serving a sentence for a non-person crime. Indeed, as was demonstrated with the performance of the VRPS (discussed next) in the classification of risk for institutional violence, an increased number of these risk factors resulted in an increased likelihood of adjudication for violent institutional infractions (see Appendix C for the base rate of institutional violations associated with historical/demographic factors) .

Utility of the Violence Risk Prediction Scale (VRPS)
in the Prediction of Institutional Violence

A violence risk classification scheme (referred to as the Violence Risk Prediction Scale, or VRPS) was developed in order to test whether information obtained during inmate classification procedures could be combined into a single measure that would accurately and practically classify inmate risk for future violent institutional behaviors. The most robust univariate predictors of adjudication for physically aggressive/violent infractions were considered for inclusion, and the final model contained self-report and historical/demographic variables, including both static (age, person crime index offense, gender, and prior incarceration status) and dynamic variables (gang affiliation, AGG, BOR, DRG, and overall PAI validity). A secondary goal of this effort was to assess both the ability of dynamic predictors to improve the accuracy of prediction above that obtained by static factors alone and the ability of self-report information to add to the accuracy of prediction.

Providing evidence of VRPS construct validity, individuals who were adjudicated for a violent institutional infraction during the current incarceration period had significantly higher VRPS scores than individuals who were not adjudicated during the same time period. Likewise, in terms of criterion/predictive validity, VRPS scores demonstrated a robust relationship with a dichotomous index of physical aggression and were a strong predictor of future violent institutional behaviors. The actual base-rates of adjudication increased in a linear fashion with VRPS scores, with individuals placed into the top two VPRS score probability bins demonstrating a base rate of adjudication for violent behaviors more than 4 times that of the sample as a whole. No subjects who were placed in the bottom three VRPS bins were adjudicated for a violent infraction. In fact, a VRPS total score increase of 1 was associated with almost 3 times greater likelihood of adjudication for physically aggressive behaviors. On the basis of ROC analyses, the VRPS demonstrated strong overall accuracy in the prediction of adjudication for a violent infraction independent of base rate. Indeed, although the purpose of this study was not to design a clinical tool for widespread use in correctional risk classification, the accuracy of prediction demonstrated by the VRPS (*AUC* = .715) was such that it performed on par or better in the prediction of violent institutional behaviors than many well-established risk assessment methods such as the PCL-R (*AUC* = .575), LSI-R (*AUC* = .609), HCR-20 (*AUC* = .565), and VRAG (*AUC* = .627; Kroner & Mills, 2001). In addition, the VRPS performed moderately well in the prediction of other infraction types, attesting to overlapping constructs in the prediction of violent and other problematic institutional behaviors.

Much debate has existed regarding the optimal method of communicating risk for violent behaviors to decision makers (see Heilbrun, Dvoskin, Hart, & McNiel, 1999; Monahan & Steadman, 1996). Rather than attempting to make absolute predictions regarding who would or would not commit a violent infraction, in the current study risk was classified relative to the sample as a whole. In fact, given the generally low base rate of adjudication for violent behaviors within correctional settings, attempts at predicting which inmates would become violent would have resulted in a high percentage of false positive errors (Loza, 2003; Kroner, 2005; Monahan, 1981; Schaffer et al., 1994). For example, subjects who scored greater than 1 on the VPRS demonstrated more than 4 times greater likelihood of adjudication than did the sample as a whole (33.6%); however, if a VPRS score of 1 had been used as a cutoff for absolute prediction, 66.4% of those subjects who would have been predicted to commit a violent infraction would not have demonstrated such behaviors. Thus, these data provide a concrete example that, even in instances when ROC analysis demonstrates strong predictive accuracy, the creation of an absolute prediction cutoff point for a low base rate event will ultimately result in a high false positive rate, despite the use of an operating point that represents the greatest specificity for a given measure.

An exception to the standard that one should avoid making absolute predictions about future violent behaviors exists when a subgroup of individuals displays an *extremely low* base rate of violent infraction (Edens & Ruiz, 2005). Such predictions appear to be possible with VRPS scores. For example, individuals scoring less than -2 on the VRPS (12.3% of the sample) demonstrated a base rate of violent misconduct of 1.5%. Thus, the use of a VRPS score of -2 as a decision point for prediction of non-adjudication would have resulted in a classification error rate of only 1.5%. In fact, the use of a VRPS score of -1 as a cutoff for predicting nonadjudication would have accurately classified about half of the sample as being unlikely to offend, with a corresponding error rate of only 3.3%.[6]

In terms of actual performance in forecasting risk for violent behavior, VRPS risk classification categories appeared to be valid indicators of relative risk. Significant differences in mean yearly rates of adjudication were noted across risk categories, which fell in the expected direction (i.e., *reduced risk* < *average risk* < *moderately elevated risk* < *markedly elevated risk*). When compared to average rates yearly rates of adjudication across the entire sample, the risk classification strategy was a good fit for the data, with the mean yearly rate of adjudication among those classified as being *average risk* mirroring the sample-wide mean (M = 0.071). Likewise, risk category was a significant positive predictor of adjudication for a physically aggressive infraction after controlling for the amount of time incarcerated, with each step increase in risk category representing an increased likelihood of adjudication of more than 2 times that of the category below. Individuals classified as being a *markedly elevated* risk for violent behavior were more than 4 times more likely to commit a violent offense than the average subject and were about 8.5 times more likely than individuals classified as being *reduced risk*. Thus, the risk classification strategy appeared to be an accurate and easily understood and conveyed indicator of relative risk for violent behavior.

[6] Of additional note, although probabilities of adjudication for violent behaviors were utilized to identify score ranges associated with risk classification categories, because absolute probabilities of misconduct are heavily influenced by base rates, which fluctuate across populations, nomothetic (i.e. group-based) probability risk statements based upon this sample should not be made to describe ideographic (i.e., individual) risk for violent offending in other samples (e.g., “On the basis of VRPS score, Mr. Smith has a of 23% likelihood of committing a violent infraction during the next 5 years”). Accordingly, Edens and Ruiz (2005) recommended clinicians provide statements related to relative risk (i.e., risk classification categories) and the magnitude of effect (e.g., odds ratios).

Although the VRPS was a strong predictor of adjudication of a physically aggressive infraction, because individual regression weights are likely to shrink upon application to different samples and populations (Gagliardi et al., 2004) a simple score method (SSM) based upon the direction of relationship between individual predictors and violent institutional behaviors was created for cross-validation purposes. When compared to the regression-based measure (i.e., VRPS), SSM scores were slightly less accurate in the prediction of violent misconduct, though still a robust indicator of violence risk. Nonetheless, the SSM is associated with several advantages that may outweigh its slightly reduced accuracy when compared to the VRPS, including the ease of scoring and interpretation (e.g., positive scores were associated with increased risk and negative scores were associated with decreased risk), resistance to shrinkage upon cross-validation (Cohen, 1990), and decreased dependency upon base-rate fluctuations across populations. Interestingly, when comparing the overall accuracy of risk classification categories for each method, no significant differences were found ($z = 0.86$, $p = .19$). Thus, when communicating relative risk for violent misconduct, the two methods may in fact perform equally well.

On a final note, the development of the VRPS represented an effort to examine the utility of a violence risk assessment method that included multiple types of variables, including static, dynamic, self-report, and historical variables. In particular, researchers have noted a general lack of empirical investigation regarding protective factors (Gagliardi, et al., 2004; Rogers, 2000) and dynamic risk factors (Kroner, 2003; Douglas & Skeem, 2005), and relatively few studies have investigated the integration of static and dynamic information in assessing risk (Gagliardi et al., 2004; Douglas & Skeem).

Likewise, skepticism abounds among researchers and clinicians alike regarding the usefulness of self-report information in forensic and correctional settings (Kroner & Loza, 2001; Mills, Loza, & Kroner, 2003; Walters, 2002, 2006b). Consequently, the development of the VRPS allowed for empirical examination of several areas that represent current gaps in the general risk assessment literature.

In their recommendations regarding future research addressing the complexities of risk state, Douglas and Skeem (2005) noted a need for researchers to examine the incremental predictive improvement of dynamic risk factors above that obtained by static or historical factors. When examined in isolation, although both demonstrated moderate effect sizes, the VRPS static factors demonstrated greater accuracy than VRPS dynamic factors in the prediction of future violent infractions. Both variable types added incremental validity in the prediction of adjudication over one another, and the greatest predictive accuracy was demonstrated when static and dynamic factors were combined. Thus, these data demonstrated that the addition of dynamic risk factors to static risk factors can result in significantly improved predictive accuracy. Moreover, these dynamic risk factors provide targets for risk-reducing interventions.

A similar pattern was demonstrated when separating VRPS variables according to the method of information gathering (i.e., self-report vs. historical data). Although less accurate when compared to the historical data, self-report information (defined here as PAI scales) was a significant predictor of future violent behaviors. As before, the combination of both variable types resulted in the greatest predictive accuracy, with both methods adding unique variance to the prediction of violent behavior. Of additional note, because the VPRS was designed to limit the total number of included variables, several

PAI scales and subscales that previously demonstrated univariate associations with adjudication for a physically aggressive adjudication were not included (e.g., MAN, INF, ANT, DOM, and VPI) . Future research aimed at the development of an internally generated PAI scale for the assessment of institutional violence may demonstrate accuracy in the prediction of violence above that obtained by the VRPS PAI-related variables.

General Personality Patterns Among Newly Incarcerated Adult Offenders

Although not the primary focus of this study, the obtained data allowed for a general exploration of personality traits and psychopathology levels of newly incarcerated inmates in comparison to community norms. Consistent with research showing adjustment to incarceration to be an often anxiety-producing and stressful experience (McCorkle, 1993), this sample reported generally higher levels of stress (STR), depressive symptomatology (DEP), and hypervigilance (PAR-H) than individuals in the community. Despite reporting similar levels of suicidal ideation as community members, incarcerated subjects were rated as exhibiting greater potential for future suicidal behaviors. Likewise, this sample of incarcerated offenders endorsed greater levels of impulsivity and was classified as exhibiting greater potential for future violent behaviors directed toward others than individuals in the PAI normative sample.

As expected, this sample of incarcerated offenders displayed higher mean validity scale elevations than their community counterparts, with 14% of subjects demonstrating markedly elevated validity scales (i.e., invalid profiles). When broken down according to specific scales, the majority of invalid profiles were due to attempts at positive impression management or random/careless responding. Interestingly, PIM demonstrated a mean scale elevation most similar to community norms among PAI major scales (*M* = 50.07, *d* = .01). Thus, although the subjects as a whole were no more likely to attempt to portray themselves in an overly positive light than are community members, when a profile was deemed invalid in the current study, it was most likely to be so due to such attempts. Conversely, subjects displayed higher mean elevations on other validity indexes as compared to community norms, with INF demonstrating the greatest mean elevation among validity scales.

Consistent with research that has demonstrated a large and growing population of incarcerated mentally ill offenders (Arboleda-Flórez et al., 1998; Council of State Governments, 2002; Fazel & Danesh, 2002), more than one-quarter of individuals who completed valid PAIs in the current study reported clinically significant levels of psychopathology consistent with diagnoses of major mental illness (e.g., psychotic spectrum, affective instability, etc.). Almost 5% of participants completing valid profiles endorsed levels of symptomatology on MAN, PAR, SCZ, or BOR consistent with active and persistent symptoms (Morey, 2003). When considering other Axis I psychopathology, with the exception of endorsing greater levels of distress resulting from traumatic events, incarcerated subjects displayed similar or only slightly higher levels of anxiety-spectrum symptoms (ANX and ARD) than did individuals in the community.

Unsurprisingly, this sample of incarcerated offenders reported much higher levels of antisocial behaviors and attitudes than did community members (*d* = 1.08), with more than 25% displaying clinically significant ANT scores (i.e., greater than 2 standard deviations above the community mean). However, ANT subscale analyses revealed this elevation to be primarily due to subjects' acknowledgement of a history of adolescent and adult antisocial behaviors (ANT-A), which was almost 2 standard deviations greater than community norms. In fact, subjects reported only slightly greater levels of egocentricity, callousness, and lack of empathy (ANT-E) as compared with community populations. Thus, when examined from a psychopathy framework (e.g., Hare, 1996), ANT elevations in the current study appear to have been driven mostly by behavioral characteristics (i.e., Factor 2) rather than by core personality traits (i.e., Factor 1), which was similar to scale means demonstrated in the PAI-CS norming sample (Edens & Ruiz, 2005). Although this sample as a whole reported similar levels of generally aggressive attitudes and behaviors as did the PAI norming sample, more than 10% endorsed clinical significant AGG elevations. When broken down according to subscales, subjects endorsed past behaviors and present attitudes toward physical aggression at greater frequency than did individuals in the general population.

Researchers have explicitly demonstrated significantly higher rates of alcohol and drug abuse and dependence among forensic and correctional populations when compared to the general population (Fazel et al., 2006; Lo & Stevens, 2000). Indeed, subjects' self-reported history of behaviors and negative consequences associated with alcohol and/or drug use, abuse, and dependence (ALC and DRG) were 1 to 2 standard deviations greater than the level in the PAI normative sample. More than half of the sample endorsed clinically significant levels on DRG and/or ALC, which was similar to the percentage of individuals deemed as chemically dependent through other ODOC intake procedures (57.2% and 57.9%, respectively). Perhaps reflective of greater rates of acknowledged problems, such as psychiatric symptomatology and chemical dependency, subjects endorsed greater levels of motivation for treatment than did community members.

Significant differences were found between male and female subjects on 18 of the 22 PAI scales, with two-thirds in the direction of higher elevations among females. However, small effect sizes (e.g., $d \geq .2$) were demonstrated on 10 scales, which reflected generally greater endorsement of internalized psychopathology (i.e., SOM, ANX, ARD, and DEP), schizophrenia spectrum symptomatology (SCZ), affective instability (BOR), drug dependence (DRG), and Stress (STR) among female participants. Male subjects were more inclined to present themselves in a positive light than female subjects (PIM) and were less motivated for treatment, though motivated to a greater degree than individuals in the PAI normative sample. Of note, no differences were found in reported aggressive behaviors and attitudes (AGG) between male and female subjects, and though statistically significant, very little difference in antisocial behaviors and attitudes (ANT) was demonstrated between gender groups. Although somewhat counterintuitive given community research that has regularly demonstrated greater levels of antisocial personality traits and aggressive behaviors among males when compared to females (American Psychiatric Association, 2000; Archer, 2004; Cale & Lilienfeld, 2002; Knight, Fabes, & Higgins, 1996), because a conviction for a criminal and/or antisocial behavior is a prerequisite for incarceration, it is not altogether surprising that incarcerated male and female offenders would report similar levels of antisocial and aggressive attitudes and behaviors. Indeed, Edens and Ruiz (2005) found gender to be unrelated to ANT elevations in their sample of incarcerated male and female offenders.

Strengths of the Current Study

Several methodological strengths in this study improved upon limitations associated with a majority of previous research. The opportunity to study an entire population (i.e., all individuals who completed a PAI upon intake to the ODOC between 2000 and 2005) and the corresponding size of the sample (N = 17,054) was a primary strength. In general, the larger the sample size, the more closely the obtained estimates approximate the true values for a larger population (Hanson & Bussière, 1998). Thus, to the extent that the ODOC is representative of other U.S. prison systems, because the sample was much larger than sample sizes in most identified published research in these domains, increased confidence can be placed in the obtained values as reflective of the greater U.S. prison population. Likewise, the examination of the majority of newly incarcerated offenders in one state system allowed for investigation of a much more diverse sample of incarcerated offenders than has been the case in previous studies. Indeed, this sample included male and female offenders, a variety of ethnicities, various offender subgroups (e.g., gang affiliation), and variation on other demographic factors, which facilitates generalizability to other populations.

Another major strength of this study was its prospective nature. As previously discussed, many researchers have utilized retrospective designs, which typically result in inflated effects. The longitudinal design of this study allowed for examination of the relationships between predictors and criterion variables as is typically undertaken in clinical practice. In fact, this study was designed to mirror correctional risk triage, with a large number of diverse offenders completing a similar assessment prior to collection of any behavioral data. Thus, an examination of actual predictive utility was possible, rather than having to base estimates on retrospective methods or extreme groups. Likewise, institutional violence was operationalized to reflect actual and distinct categories of behaviors, rather than nonspecific outcomes (e.g., major and minor misconduct) that are often of limited use to correctional administrators. The use of better defined categories of misconduct allows correctional administrators and researchers alike to isolate predictors of behaviors considered most relevant to their work.

The use of more sophisticated statistical analyses than those typically employed in many prior studies regarding empirical correlates of problematic institutional behaviors is another strength of this investigation. For example, many previous researchers have relied solely on correlational methods or group contrast approaches. Although such methods provide important information and were included in this study, the addition of multivariate and base-rate resistant techniques facilitated more detailed information regarding relative risk and accuracy than would have otherwise been obtained.

In regard to content, many aspects of this study had been the focus of little or no previous research. As noted earlier, few researchers have examined the PAI in correctional settings, with many scales having never been subject to empirical examination prior to this effort. Likewise, despite frequent calls from researchers and scholars for empirical investigation regarding the integration of dynamic and static risk factors in violence risk assessment, such efforts have rarely been undertaken; in fact, none were identified that focused on correctional populations. Similarly, the inclusion of multiple sources of information into one correctional violence risk classification scheme that included static, dynamic, and protective variables represented a rarely undertaken endeavor, particularly in correctional settings.

Limitations of the Current Study

As is true for all research, this study is limited in a number of ways. For example, many authors (Adams, 1986; Baskin et al., 1991; Gendreau et al., 1997; Mulvey et al.,

1994) have noted that reliance on official records as the primary method of estimating the frequency of problematic institutional behaviors may result in an underestimation of the actual base rate of misconduct. As was discussed in more detail in an earlier section, official records are problematic in that they are often applied inconsistently and only reflect those behaviors that come to the attention of prison officials and that are verified through an adjudicative process. Thus, it is expected that many problematic behaviors were not reflected in official records. A more accurate base rate of misconduct would likely have resulted had self-reported institutional misbehavior been collected and combined with official records of misconduct. Nonetheless, the willingness of inmates to openly admit violent and/or antisocial behaviors that have the potential to result in disciplinary action remains questionable.

A somewhat related limitation was the lack of information regarding sexually assaultive behaviors. Although the authors of the ODOC *Handbook for Rules of Prohibited Conduct* (Oregon Department of Corrections, 2002) included sexual assault as a rule violation, no such adjudications were noted in the data set. However, statistics obtained from the Bureau of Justice (2005) revealed the occurrence of at least five substantiated inmate-on-inmate nonconsensual sexual acts in Oregon state correctional facilities during 2004. Thus, it appeared likely that information regarding sexual assaults was absent from this data set. Therefore, pending successful cross-validation efforts in the prediction of sexual assault, the identified univariate predictors of institutional violence, as well as VRPS score fluctuations, should not be applied to the classification of risk for sexually assaultive behaviors.

Although the diversity of subjects was a tremendous strength when compared to previous research, certain limitations associated with the administration of the PAI impacted the generalizability of findings to certain populations. More specifically, those individuals whose reading abilities were estimated to be below the fourth-grade level by a standardized educational measure did not complete a PAI and thus were not included for study. Similarly, although a Spanish version of the PAI was available for administration with Spanish-speaking individuals, many potential subjects whose primary languages were other than English or Spanish did not complete a PAI and were not included in the study.

Finally, certain limitations inherent to this research design reduced the overall utility of findings. Because temporal information was not analyzed, these results did not address potential differences among predictors for acute and chronic risk, which is of paramount concern to correctional administrators. Likewise, although an examination of the utility of various predictors of problematic behaviors during incarceration as assessed upon intake provided important information, such a design failed to take into account the ebb and flow of risk state over time and the fact that some risk factors include time-specific components (e.g., negative affectivity; Douglas & Skeem, 2005). Similarly, no environmental information was included, which ignores the impact of environmental influences on absolute risk. For example, population density, ongoing mental health or chemical dependency treatment, and/or available educational/vocational participation are likely to impact overall risk. Future research that includes assessment of environmental influences and multiple assessments over time would be invaluable in addressing risk for problematic institutional behaviors over the course of incarceration and in the identification of acute risk and protective factors.

Future Directions

A significant strength of this study was the sheer amount of information provided through multiple descriptive and inferential analyses. Because much of this effort was exploratory in nature, several areas for future research were identified, many of which bear further discussion.

In general, cross-validation efforts are necessary to assess the generaliziblity of findings to different samples of incarcerated offenders, including the utility of univariate predictors in the prediction of institutional misconduct and the ability of the VRPS and corresponding risk categories to accurately forecast violent behaviors. The inclusion of both subjective self-report and official records of misconduct is recommended because use of both would provide a more rounded picture of the base rates of institutional misconduct. In fact, the development and testing of strategies aimed at accurately gathering such information from incarcerated offenders would be beneficial in this regard. Likewise, future efforts that include risk classification at multiple time points would further provide useful information regarding risk state fluctuations, as well as about the accuracy of short- and long-term prediction and the potential antecedents to the ebb and flow of absolute risk. This recommendation is particularly relevant in regard to dynamic factors, because assessment of dynamic factors at a single point in time, as is the case for most research, “forces them to function like static variables in prediction equations” (Gagliardi et al., 2004, p. 150).

In regard to univariate predictors of institutional misconduct and violence, including individual PAI scales, efforts should be made to identify and assess the impact of potential mediating and moderating factors on the strength and direction of the aforementioned relationship with problematic institutional behaviors (e.g., Does the strength of relationship between ANT and physically aggressive behaviors differ as a function of gender?). Likewise, efforts to identify interaction effects between predictor variables would provide valuable information regarding correctional risk assessment (e.g., Do mental health problems interact with antisocial beliefs to increase risk?). Similarly efforts to identify and assess additional potential univariate predictors of institutional misconduct, particular those dynamic in nature, could increase the accuracy of prediction and would provide additional ammunition for risk-reduction strategies.

Finally, although not originally designed as a correctional measure, a growing body of research attests to the utility of the PAI in correctional settings. Increased research effort into the validity of the PAI as a mental health diagnostic tool in correctional settings is sorely needed, as the majority of correctional research has investigated associations with institutional misconduct. Similarly, because many scales assess features associated with information that may be useful in correctional programming and decision making, opportunity exists for the development of specialized correctional scales, including violence risk classification.

Conclusions

The results of the current study provide support for the PAI as an aid to correctional decision makers in the classification of risk for violent and disruptive behaviors among newly incarcerated offenders. Likewise, the combination of historical/demographic variables and PAI-related scales resulted in a simple correctional risk assessment scheme that demonstrated robust accuracy in the classification of potential for violent institutional behaviors. In addition to providing potentially useful tools to aid correctional decision makers in the classification of newly incarcerated offenders, the results of this study also highlight the importance of the identification and consideration of protective factors and dynamic risk factors in the accuracy of risk assessment. These factors provide tangible targets for risk reducing interventions, which should be of paramount importance to correctional administrators, policy makers, clinicians, and researchers, who are tasked with the responsibility of identifying and implementing procedures that enhance the safety and security of correctional settings. Indeed, as argued by Hart (1998), because the ultimate purpose of risk assessment/classification should be risk prevention, those charged with the task of identifying individuals as being at risk for violent behavior “are bound--morally, ethically, and legally--to prove themselves wrong” (p. 123).

REFERENCES

Adams, K. (1983). Former mental patients in a prison and parole system: A study of socially disruptive behavior. *Criminal Justice and Behavior*, *10*, 358-384.

Adams, K. (1986). The disciplinary experiences of mentally disordered inmates. *Criminal Justice and Behavior*, *13*, 297-316.

Alexander, J., & Austin, J. (1992). *Handbook for evaluating objective prison classification systems*. Washington, DC: U.S. Department of Justice.

American Correctional Association. (1993). *Gangs in correctional facilities: A national assessment*. Washington, DC: U.S. Department of Justice.

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed, revised). Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author

American Psychological Association. (1978). Report of the task force on the role of psychology in the criminal justice system. *American Psychologist*, *33*, 1099-1113.

Andrews, D. A. (1982). *The Level of Service Inventory: The first follow-up*. Toronto, Canada: Ontario Ministry of Correctional Service.

Andrews, D. A., & Bonta, J. (1995). *Level of Service Inventory-Revised: User manual*. Cincinnati, OH: Anderson.

Andrews, D. A., Bonta, J., & Wormith, J. S. (1995). *Level of Service Inventory-Ontario Revision (LSI-OR): Interview and scoring guide*. Toronto, Canada: Ontario Ministry of the Solicitor General and Correctional Services.

Appelbaum, P. S., Robbins, P. C., & Monahan, J. (2000). Violence and delusions: Data from the MacArthur Violence Risk Assessment Study. *American Journal of Psychiatry*, 157, 566-572.

Arboleda-Flórez, J., Holley, H., & Crisanti, A. (1998). Understanding causal paths between mental illness and violence. *Social Psychiatry and Psychiatric Epidemiology, 33*, S38-S46.

Archer, J. (2004). Sex differences in aggression in real-world settings: A meta-analytic review. *Review of General Psychology*, *8*, 291-322.

Bagby, R. M., Nicholson, R. A., Bacchiochi, J. R., Ryder, A. G., & Bury, A. S. (2002). The predictive capacity of the MMPI–2 and PAI validity scales and indexes to detect coached and uncoached feigning. *Journal of Personality Assessment*, *78*, 69–86

Barbaree, H. E., Seto, M. C., Langton, C. M., & Peacock, E. (2001). Evaluating the predictive accuracy of six risk assessment instruments for adult sex offenders. *Criminal Justice and Behavior*, *28*, 490-521.

Baskin, D. R., Sommers, I., & Steadman, H. J. (1991). Assessing the impact of psychiatric impairment on prison violence. *Journal of Criminal Justice, 19,* 271-280.

Barratt, E. S. (1994). Impulsiveness and aggression. In J. Monahan and H. J. Steadman (Eds.), *Violence and mental disorder: Developments and risk assessment* (pp. 61-80). Chicago: University of Chicago.

Beck, A. T., & Steer, R. A. (1987). *Beck Depression Inventory manual*. San Antonio, TX: The Psychological Corporation.

Belfrage, H., Fransson, G., & Strand, S. (2000). Prediction of violence using the HCR-20: A prospective study in two maximum-security correctional institutions. *The Journal of Forensic Psychiatry*, *11*, 165-175.

Bell-Pringle, V. J., Pate, J. L., & Brown, R. C. (1997). Assessment of borderline personality disorder using the MMPI-2 and the Personality Assessment Inventory. *Assessment*, *1*, 131-139.

Belter, R. W., & Piotrowski, C. (2001). Current status of doctoral level training in psychological testing. *Journal of Clinical Psychology*, *57*, 717-726.

Benning, S. D., Patrick, C. J., Hicks, B. M., Blonigen, D. M., & Krueger, R. F. (2003). Factor structure of the Psychopathic Personality Inventory: Validity and implications for clinical assessment. *Psychological Assessment*, *15,* 340-350.

Berardino, S. D., Meloy, J. R., Sherman, M., & Jacobs, D. (2005). Validation of the Psychopathic Personality Inventory on a female inmate sample. *Behavioral Sciences and the Law*, *23*, 819-836.

Blackburn, R. (1988). On moral judgments and personality disorders: The myth of psychopathic personality revisited. *British Journal of Psychiatry*, *153*, 505-512.

Blais, M. A., Holdwick, D. J., Jr., McLean, R. Y. S., Otto, M. W., Pollack, M. H., & Hilsenroth, M. J. (2003). Exploring the psychometric properties and construct validity of the MCMI-III Anxiety and Avoidant Personality Scales. *Journal of Personality Assessment*, *81*, 237-241.

Blanchard, D. D., McGrath, R. E., Pogge, D. L., & Khadivi, A. (2003). A comparison of the PAI and MMPI-2 as predictors of faking bad in college students. *Journal of Personality Assessment*, *80*, 197-205.

Bloom, J. D. (1989). The character of danger in psychiatric practice: Are the mentally ill dangerous? *Bulletin of the American Academy of Psychiatry and Law*, *17*, 241-255.

Boone, D. (1998). Internal consistency reliability of the Personality Assessment Inventory with psychiatric inpatients. *Journal of Clinical Psychology*, *54*, 839-843.

Bonta, J. (1999). *Approaches to offender risk assessment: Static vs. dynamic. Research Summary*, (Vol. 4). Ottawa, Canada: Corrections Research and Development, Solicitor General Canada.

Bonta, J., Law, M., & Hanson, K. (1998). The prediction of criminal and violent recidivism among mentally disordered offenders: A meta-analysis. *Psychological Bulletin*, *123*, 123-142.

Bonta, J., & Motiuk, L. L. (1990). Classification to halfway houses: A quasi-experimental evaluation. *Criminology*, *28*, 497-506.

Bonta, J., & Motiuk, L. L. (1992). Inmate classification. *Journal of Criminal Justice*, *20*, 343-353.

Borum, R. (1996). Improving the clinical practice of violence risk assessment: Technology, guidelines, and training. *American Psychologist*, *51*, 945-956.

Boyle, G. J. (1995). Personality Assessment Inventory. In J. C. Conoley & J. C. Impara (Eds.), *The twelfth mental measurements yearbook* (pp. 764-768). Lincoln, Nebraska: University of Nebraska Press.

Boyle, G. J. (1996). Psychometric limitations of the Personality Assessment Inventory: A reply to Morey's (1995) rejoinder. *Journal of Psychopathology and Behavioral Assessment*, *18*, 197-204.

Boyle, G. J., & Lennon, T. J. (1994). Examination of the reliability and validity of the Personality Assessment Inventory. *Journal of Psychopathology and Behavioral Assessment*, *16*, 173-187.

Buffington-Vollum, J., Edens, J. F., Johnson, D. W., & Johnson, J. K. (2002). Psychopathy as a predictor of institutional misbehavior among sex offenders: A prospective replication. *Criminal Justice and Behavior*, *29*, 497-511.

Bureau of Justice Statistics. (2001). *Mental health treatment in state prisons, 2000*. Washington, DC: U.S. Department of Justice.

Bureau of Justice Statistics. (2003a). *Census of state and federal correctional facilities, 2000*. Washington, DC: U.S. Department of Justice.

Bureau of Justice Statistics. (2003b). *Education and correctional populations*. Washington, DC: U.S. Department of Justice.

Bureau of Justice Statistics. (2004). *Prisoners in 2003.* Washington, DC: U.S. Department of Justice.

Bureau of Justice Statistics. (2005). *Sexual violence reported by correctional authorities, 2004*. Washington, DC: U.S. Department of Justice.

Bureau of Justice Statistics. (2006). *Prison and jail inmates at midyear 2005*. Washington, DC: U.S. Department of Justice.

Buss, A. H., & Perry, M. (1992). The Aggression Questionnaire. *Journal of Personality and Social Psychology*, *63*, 452-459.

Butcher, J. N., Graham, J. R., Ben-Porath, Y. S., Tellegen, A., Dahlstrom, W. G., & Kaemmer, B. (1989). *MMPI-2: Manual for administration and scoring.* Minneapolis, MN: University of Minnesota Press.

Butcher, J. N., & Rouse, S. V. (1996). Personality: Individual differences and clinical assessment. *Annual Review of Psychology*, *47*, 87-111.

Cale, E. M., & Lilienfeld, S. O. (2002). Sex differences in psychopathy and antisocial personality disorder: A review and integration. *Clinical Psychology Review*, *22*, 1179-1207.

Capterton, J. D., Edens, J. F., & Johnson, J. K. (2004). Predicting sex offender institutional adjustment and treatment compliance using the Personality Assessment Inventory. *Psychological Assessment*, *16*, 187-191.

Carbonell, J. L., Megargee, E. I., & Moorhead, K. M. (1984). Predicting prison adjustment with structured personality inventories. *Journal of Consulting and Clinical Psychology, 52*, 280-294.

Carey, R. J., Garske, J. P., & Ginsberg, J. (1987). The prediction of adjustment to prison by means of an MMPI based classification system. *Criminal Justice and Behavior*, *13*, 347-365.

Clark, J. H. (1948). Application of the MMPI in differentiating AWOL recidivists from non-recidivists. *Journal of Psychology*, *26*, 229-234.

Clark, M. J., Gironda, R. J., & Young, R. W. (2003). Detection of back random responding: Effectiveness of MMPI-2 and Personality Assessment Inventory Validity Indices. *Psychological Assessment*, *15*, 223-234.

Cleckley, H. (1941). *The mask of sanity*. St. Louis, MO: Mosby.

Clements, C. B. (1996). Offender classification: Two decades of progress. *Criminal Justice and Behavior, 23*, 121-143.

Chapman, A. L., Gremore, T. M., & Farmer, R. F. (2003). Psychometric analysis of the Psychopathic Personality Inventory (PPI) with female inmates.

Cohen, J. (1988). *Statistical power analyses for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cohen, J. (1990). Things I have learned (so far). *American Psychologist*, *45*, 1304-1312.

Compton, T., & Meacham, M. (2005). Prison gangs: Descriptions and selected interventions. *The Forensic Examiner, 14*, 26-30.

Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment, 13*, 171-188.

Cooper, R. P., & Werner, P. D. (1990). Predicting violence in newly admitted inmates: A lens model analysis of staff decision making. *Criminal Justice and Behavior, 17*, 433-447.

Conger, A. J., & Conger, J. C. (1996). Did too, did not! Controversies in the construct validation of the PAI. *Journal of Psychopathology and Behavioral Assessment, 18*, 205-212.

Cornell, D. G., Peterson, C. S., & Richards, H. (1999). Anger as a predictor of aggression among incarcerated adolescents. *Journal of Consulting and Clinical Psychology, 67*, 108-115.

Council of State Governments. (2002). *Criminal Justice/Mental Health Consensus Project*. New York: Author.

Cox, V. C., Paulus, P. B., & McCain, G. (1984). Prison crowding research: The relevance for prison housing standards and a general approach regarding crowding phenomena. *American Psychologist*, *39*, 1148-1160.

Craig, R. J. (1997). A selected review of the MCMI empirical literature. In T. Millon (Ed.), *The Millon Inventories: Clinical and personality assessment* (pp. 303-326). New York: Guilford.

Craig, R. J., & Weinberg, D. (1992a). Assessing drug abusers with the Millon Clinical Multiaxial Inventory: A review. *Journal of Substance Abuse Treatment*, *9*, 249-255.

Craig, R. J., & Weinberg, D. (1992b). Assessing alcoholics with the Millon Clinical Multiaxial Inventory: A review. *Psychology of Addictive Behaviors*, *6*, 200-208.

Cullen, F. T., Latessa, E. J., Burton Jr., V. S., & Lombardo, L. X. (1993). The correctional orientation of prison wardens: Is the rehabilitative ideal supported? *Criminology*, *31*, 69-92.

Cunningham, M. D., & Reidy, T. J. (1998a). Antisocial personality disorder and psychopathy: Diagnostic dilemmas in classifying patterns of antisocial behavior in sentencing evaluations. *Behavioral Sciences and the Law*, *16*, 33-351.

Cunningham, M. D., & Reidy, T. J. (1998b). Integrating base rate data in violence risk assessments at capital sentencing. *Behavioral Science and the Law*, *16*, 74-95.

Cunningham, M. D., & Reidy, T. J. (2002). Violence risk assessment at federal capital sentencing: Individualization, generalization, relevance, and scientific standards. *Criminal Justice and Behavior*, *29*, 512-537.

Cunningham, M. D., Sorensen, J. R., & Reidy, T. J. (2005). An actuarial model for assessment of prison violence risk among maximum security inmates. *Assessment*, *12*, 40-49.

Daubert v. Merrell Dow Pharmaceuticals, Inc., U.S. 113 S. Ct. 2786 (1993).

Dawes, R. M. (1979). The robust beauty of improper linear models in decision making. *American Psychologist*, *34*, 571-582.

Dawes, R. M., & Corrigan, B. (1974). Linear models in decision making. *Psychological Bulletin*, *81*, 95-106.

Decker, S. H., & Van Winkle, B. (1996). *Life in the gang: Friends, family, and violence*. Cambridge, United Kingdom: Cambridge University Press.

Dernevik, M., Grann, M., & Johansson, S. (2002). Violent behavior in forensic psychiatric patients: Risk assessment and different risk-management levels using the HCR-20. *Psychology, Crime, & Law*, *8*, 93-111.

Deisinger, J. A. (1995). Exploring the factor structure of the Personality Assessment Inventory. *Assessment*, *2*, 173-179.

de Vogel, V., & de Ruiter, C. (2005). The HCR-20 in personality disordered female offenders: A comparison with a matched sample of males. *Clinical Psychology and Psychotherapy*, *12*, 226-240.

DiCataldo, F., Greer, A., & Profit, W. E. (1995). Screening prison inmates for mental disorder: An examination of the relationship between mental disorder and prison adjustment. *Bulletin of the American Academy of Psychiatry and Law, 23*, 573-585.

Douglas, K. S., Hart, S. D., & Kropp, P. R. (2001). Validity of the Personality Assessment Inventory for Forensic Assessments. *International Journal of Offender Therapy and Comparative Criminology*, *45*, 183-197.

Douglas, K. S., Ogloff, J. R. P., Nicholls, T. L., & Grant, I. (1999). Assessing risk for violence among psychiatric patients: The HCR-20 violence risk assessment scheme and the Psychopathy Checklist: Screening Version. *Journal of Consulting and Clinical Psychology*, *67*, 917-930.

Douglas, K. S., & Skeem, J. L. (2005). Violence risk assessment: Getting specific about being dynamic. *Psychology, Public Policy, and the Law*, *11*, 347-383.

Douglas, K. S., & Webster, C. D. (1999). The HCR-20 violence risk assessment scheme: Concurrent validity in a sample of incarcerated offenders. *Criminal Justice and Behavior*, *26*, 3-19.

Duellman, R. M., & Bowers, T. G. (2004). Use of the Personality Assessment Inventory in forensic and correctional settings: Evidence of concurrent validity. *International Journal of Forensic Psychology*, *1*, 42-57.

Dyer, F. J., & McCann, J. T. (2000). The Millon Clinical Inventories, research critical of their forensic application, and *Daubert* criteria. *Law and Human Behavior*, *24*, 487-497.

Edens, J. F. (2001). Misuses of the Hare Psychopathy Checklist-Revised in court: Two case examples. *Journal of Interpersonal Violence, 16*, 1082-1093.

Edens, J. F., Cruise, K. R., & Buffington-Vollum, J. K. (2001). Forensic and correctional applications of the Personality Assessment Inventory. *Behavioral Sciences and the Law*, *19*, 519-43.

Edens, J. F., Hart, S. D., Johnson, D. W., Johnson, J. K., & Olver, M. E. (2000). Use of the Personality Assessment Inventory to assess psychopathy in offender populations. *Psychological Assessment*, *12*, 132-139.

Edens, J. F., Petrila, J., & Buffington-Vollum, J. K. (2001). Psychopathy and the death penalty: Can the Psychopathy Checklist-Revised identify offenders who represent a continuing threat to society? *The Journal of Psychiatry and Law*, *29*, 433-481.

Edens, J. F., Poythress, N. G., & Lilienfeld, S. O. (1999). Identifying inmates at risk for disciplinary infractions: A comparison of two measures of psychopathy. *Behavioral Sciences and the Law*, *17*, 435-443.

Edens, J. F., Poythress, N. G., Watkins, M. M. (2001). Further validation of the Psychopathic Personality Inventory among offenders: Personality and behavioral correlates. *Journal of Personality Disorders*, *15*, 403-415.

Edens, J. F., & Ruiz, M. A. (2005). *PAI Interpretive Report for Correctional Settings (PAI-CS) Professional Manual*. Lutz, FL: Psychological Assessment Resources.

Edens, J. F., & Ruiz, M. A. (2006). On the validity of validity scales: The importance of defensive responding in the prediction of institutional misconduct. *Psychological Assessment*, *18*, 220-224.

Ekland-Olson, S., Barrick, D. M., & Cohen, L. E. (1983). Prison overcrowding and disciplinary problems: An analysis of the Texas prison system. *Journal of Applied Behavioral Sciences*, *19*, 163-176.

Ellis, L. & Walsh, A. (1999). Criminologists' opinions about causes and theories of crime and delinquency. *The Criminologist*, *24*(4), 1-6.

Estroff, S. E., & Zimmer, C. (1994). Social networks, social support, and violence among persons with severe and persistent mental illness. In J. Monahan and H. J. Steadman (Eds.), *Violence and mental disorder: Developments and risk assessment* (pp. 259-296). Chicago: University of Chicago.

Fantoni-Salvador, P., & Rogers, R. (1997). Spanish versions of the MMPI-2 and PAI: An investigation of concurrent validity with Hispanic patients. *Assessment*, *4*, 29-39.

Fazel, S. & Danesh, J. (2002). Serious mental disorder in 23,000 prisoners: a systematic review of 62 surveys. *The Lancet*, *359*, 545-550

Fazel, S., Bains, P., & Doll, H. (2006). Substance abuse and dependence in prisoners: A systematic review. *Addiction*, *101*, 181-191.

Federal Bureau of Investigation (2005). *Crime in the United States: 2004*. Washington DC: U.S. Department of Justice.

Field, A. (2005). *Discovering statistics using SPSS* (2nd ed.). New York: Sage.

Fischer, D. R. (2001). *Arizona Department of Corrections: Security threat group (STG) program evaluation, final report*. Rockville, MD: National Institute of Justice.

Flanagan, T. J. (1983). Correlates of institutional misconduct among state prisoners: A research note. *Criminology, 21*, 29-39.

Fong, R. S., & Vogel, R. E. (1995). A comparative analysis of prison gang members, security threat group inmates, and general population prisoners in the Texas Department of Corrections. *Journal of Gang Research*, *2*, 1-12.

Fong, R. S., Vogel, R. E., & Buentello, S. (1996). Prison gang dynamics: A research update. In J. M. Miller & J. P. Rush (Eds.), *Gangs: A criminal justice approach*, (pp. 105-128). Cincinnati, OH: Anderson.

Forth, A. E., Hart, S. D., & Hare, R. D. (1990). Assessment of psychopathy in male young offenders. *Journal of Consulting and Clinical Psychology, 2*, 342-344.

Gaes, G. G., & McGuire, W. J. (1985). Prison violence: The contribution of crowding versus other determinants of prison assault rates. *Journal of Research in Crime and Delinquency*, *22*, 41-65.

Gaes, G. G., Wallace, S., Gilman, E., Klein-Saffran, J., & Suppa, S. (2002). The influence of prison gang affiliation on violence and other prison misconduct. *The Prison Journal*, *82*, 359-385.

Gagliardi, G. J., Lovell, D., Peterson, P. D., & Jemelka, R. (2004). Forecasting recidivism in mentally ill offenders released from prison. *Law and Human Behavior*, *28*, 133-154.

Gallop, R. J., Crits-Christoph, P., Munez, L. R., & Tu, X. M. (2003). Determination and interpretation of the optimal operating point for ROC curves derived through generalized linear models. *Understanding Statistics*, *2*, 219-242.

Gendreau, P., Goggin, C. E., & Law, M. A. (1997). Predicting prison misconducts. *Criminal Justice and Behavior*, *24*, 414-431.

Gendreau, P., Goggin, C., & Smith, P. (2003). Is the PCL-R really the "unparalleled" measure of offender risk? A lesson in knowledge cumulation. *Criminal Justice and Behavior, 29,* 397-426.

Gendreau, P., Little, T., & Goggin, C. (1996). A meta-analysis of the predictors of adult offender recidivism. *Criminology, 34,* 575-607.

Girard, L., & Wormith, J. S. (2004). The predictive validity of the Level of Service Inventory-Ontario Revision on general and violent recidivism among various offender groups. *Criminal Justice and Behavior, 31,* 150-181.

Glover, A. J., Nicholson, D. E., Hemmati, T., Bernfeld, G. A., & Quinsey, V. L. (2002). A comparison of predictors of general recidivism among high risk federal offenders. *Criminal Justice and Behavior, 29,* 235-249.

Guy, L. S., Edens, J. F., Anthony, C., & Douglas, K. S. (2005). Does psychopathy predict institutional misconduct among adults? A meta-analytic investigation. *Journal of Consulting and Clinical Psychology,* 73*, 1056-1064.*

Guyton, M. R., Haun, J. J., & Arnaut, G. L. Y. (2006, March). Major mental illness in prison: Risk factor for maladjustment? Paper presented at the annual meeting of the American Psychology - Law Society, St. Petersburg, FL.

Granic, I., &, Butler, S. (1998). The relationship between anger and antisocial beliefs in young offenders. *Personality and Individual Differences, 24,* 759-765.

Grove, W. M., & Meehl, P. E. (1996). Comparative efficiency of informal (subjective, impressionistic) and formal (mechanical, algorithmic) prediction procedures: The clinical-statistical controversy. *Psychology, Public Policy, Law, 2,* 293-323.

Grove, W. M., Zald, D. H., Lebow, B. S., Snitz, B. E., & Nelson, C. (2000). Clinical versus mechanical prediction: A meta-analysis. *Psychological Assessment, 12,* 19-30.

Hanley, J. A., & McNeil, B. J. (1983). A method of comparing areas under receiver operating characteristic curves derived from same cases. *Radiology, 148,* 839-843.

Hanson, R. K., & Buissère, M. T. (1998). Predicting relapse: A meta-analysis of sexual offender recidivism studies. *Journal of Consulting and Clinical Psychology, 66,* 348-362.

Hanson, R. W., Moss, C. S., Hosford, R. E., & Johnson, M. E. (1983). Predicting inmate penitentiary adjustment: An assessment of four classificatory methods. *Criminal Justice and Behavior, 10,* 293-309.

Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences*, *1*, 111-119.

Hare, R. D. (1983). Diagnosis of antisocial personality disorder in two prison populations. *American Journal of Psychiatry*, *140*, 887-890.

Hare, R. D. (1985). Comparison of procedures for the assessment of psychopathy. *Journal of Consulting and Clinical Psychology*, *53*, 7-16.

Hare, R. D. (1991). *The Hare Psychopathy Checklist-Revised*. Toronto: Multi-Health Systems.

Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. *Criminal Justice and Behavior*, *23*, 25-54.

Hare, R. D. (1998). The Hare PCL-R: Some issues concerning its use and misuse. *Law and Criminological Psychology*, *3*, 99-119.

Hare, R. D. (2003). *Hare Psychopathy Checklist-Revised Technical Manual* (2nd ed.). Toronto: Multi-Health Systems Inc.

Hare, R. D., Clark, D., Grann, M., & Thornton, D. (2000). Psychopathy and the predictive validity of the PCL-R: An international perspective. *Behavioral Sciences and the Law*, *18*, 623-645.

Hare, R. D., Harpur, T. J., Hakstian, A. R., Forth, A. E., Hart, S. D., & Newman, J. P. (1990). The Revised Psychopathy Checklist: Reliability and factor structure. *Psychological Assessment*, *2*, 338-341.

Hare, R. D., & McPherson, L. M. (1984). Violent and aggressive behavior by criminal psychopaths. *International Journal of Law and Psychiatry, 7*, 35-50.

Harpur, T. J., Hare, R. D., & Hakstain, R. (1989). Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*, *1*, 6-17.

Harris, G. T., Rice, M. E., & Camilleri, J. A. (2004). Applying a forensic actuarial assessment (the Violence Risk Appraisal Guide) to nonforensic patients. *Journal of Interpersonal Violence, 19*, 1063-1074.

Harris, G. T., Rice, M. E., & Cormier, C. A. (2002). Prospective replication of the Violence Risk Appraisal Guide in predicting violent recidivism among forensic patients. *Law and Human Behavior, 26*, 377-394.

Harris, G. T., Rice, M. E., & Quinsey, V. L. (1993). Violent recidivism of mentally disordered offenders: The development of a statistical prediction instrument. *Criminal Justice and Behavior*, *20*, 315-335.

Hart, S. D. (1998). The role of psychopathy in assessing risk for violence: Conceptual and methodological issues. *Legal and Criminological Psychology, 3*, 121-137.

Hart, S. D., Cox, D. N., & Hare, R. D. (1995). *The Hare Psychopathy Checklist: Screening Version (PCL:SV)*. Toronto: Multi-Health Systems.

Hart, S. D., & Hare, R. D. (1997). Psychopathy: Assessment and association with criminal conduct. In D. M. Stoff, J. Breiling, & J. D. Masser (Eds.), *Handbook of antisocial behavior* (pp. 22-35). Hoboken, NJ: John Wiley & Sons.

Hart, S. D., Kropp, P. R., & Hare, R. D. (1988). Performance of male psychopaths following conditional release from prison. *Journal of Consulting and Clinical Psychology*, *56*, 227-232.

Heilbrun, K., Dvoskin, J., Hart, S., & McNiel, D. (1999). Violence risk communication: Implications for research, policy, and practice. *Health, Risk, and Society*, *1,* 91-106.

Heilbrun, K. Hart, S. D., Hare, R. D., Gustafson, D., Nunez, C., & White, A. J. (1998). Inpatient and postdischarge aggression in mentally disordered offenders: The role of psychopathy. *Journal of Interpersonal Violence*, *13,* 514-527.

Helms, E. (1993). A modern instrument for evaluating psychopathology - The Personality Assessment Inventory: Professional Manual. *Journal of Personality Assessment, 61,* 414-417.

Hemmens, C., & Marquart, J. W. (1999). Straight time: Inmates' perceptions of violence and victimization in the prison environment. *Journal of Offender Rehabilitation*, *28,* 1-21.

Hemphill, J. F., Hare, R. D., & Wong, S. (1998). Psychopathy and recidivism: A review. *Legal and Criminological Psychology*, *3*, 139-170.

Hemphill, J. F., & Hare, R. D. (2004). Some misconceptions about the Hare PCL-R and risk assessment: A reply to Gendreau, Goggin, and Smith. *Criminal Justice and Behavior*, *31*, 203-243.

Hill, C. D., Neumann, C. S., & Rogers, R. (2004). Confirmatory factor analysis of the Psychopathy Checklist: Screening Version in offenders with Axis I disorders. *Psychological Assessment*, *16*, 90-95.

Hill, C. D., Rogers, R., & Bickford, M. E. (1996). Predicting aggressive and socially disruptive behavior in a maximum security forensic hospital. *Journal of Forensic Sciences*, *41*, 56-59.

Hilton, N. Z., Harris, G. T., & Rice, M. E. (2001). Predicting violence by serious wife assaulters. *Journal of Interpersonal Violence*, *16*, 408-423.

Hirschi, T., & Gottfredson, M. (1983). Age and the explanation of crime. *American Journal of Sociology, 89*, 552-584.

Hollin, C. R., Palmer, E. J., & Clark, D. (2004). The Level of Service Inventory-Revised profile of English prisoners: A needs analysis. *Criminal Justice and Behavior, 30*, 422-440.

Jemelka, R. P., Wiegand, G. A., Walker, E. A., & Trupin, E. W. (1992). Computerized offender assessment: Validation study. *Psychological Assessment, 4*, 138-144.

Jensen, G. F. (1977). Age and rule-breaking behavior: A test of sociocultural interpretations. *Criminology*, *14*, 555-568.

Kavan. M. G. (1995). Personality Assessment Inventory. In J. C. Conoley & J. C. Impara (Eds.), *The twelfth mental measurements yearbook* (pp. 764-768). Lincoln, Nebraska: University of Nebraska Press.

Kelln, B. R., Dozois, D. J. A., McKenzie, I. E. (1998). An MCMI-III discriminant function analysis of incarcerated felons: Prediction of subsequent institutional misconduct. *Criminal Justice and Behavior*, *25*, 177-189.

Kennedy, T. D. (1986). Trends in inmate classification: A status report of two computerized psychometric approaches. *Criminal Justice and Behavior*, *13*, 165-184.

Klassen, D., & O'Connor, W. A. (1994). Demographic and case history variables in risk assessment. In J. Monahan and H. J. Steadman (Eds.), *Violence and mental disorder: Developments and risk assessment* (pp. 229-258). Chicago: University of Chicago.

Knight, G. P., Fabes, R. A., & Higgins, D. A. (1996). Concerns about drawing causal inferences from meta-analyses: An example in the study of gender differences in aggression. *Psychological Bulletin, 119*, 410-420.

Knox, G. W. (2000). A national assessment of gangs and security threat groups (STGs) in adult correctional institutions: Results of the 1999 adult corrections survey. *Journal of Gang Research, 7*(3), 1-45.

Kossen, D. S., Steuerwald, B. L., Forth, A. E., & Kirkhart, K. J. (1997). A new method for assessing the interpersonal behavior of psychopathic individuals: Preliminary validation studies. *Psychological Assessment*, *9*, 89-101.

Kroner, D. G. (2005). Issues in violence risk assessment: Lessons learned and future directions. *Journal of Interpersonal Violence*, *20*, 231-235.

Kroner, D. G., & Loza, W. (2001). Evidence for the efficacy of self-report in predicting nonviolent and violent criminal recidivism. *Journal of Interpersonal Violence*, *16*, 168-177.

Kroner, D. G., & Mills, J. F. (2001). The accuracy of five risk appraisal instruments in predicting institutional misconduct and new convictions. *Criminal Justice and Behavior*, *28*, 471-489.

Kropp, P. R., Cox, D. N., & Roesch, R. (1989). The perceptions of correctional officers toward mentally disordered offenders. *International Journal of Law and Psychiatry*, *2*, 181-188.

Kruh, I. P., Whittemore, K., Arnaut, G. L. Y., Manley, J., Gage, B., & Gagliardi, G. J. (2005). The concurrent validity of the psychopathic personality inventory and its relative association with past violence in a sample of insanity acquittees. *International Journal of Forensic Mental Health*, *4*, 135-145.

Lilienfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment*, *66*, 488-524.

LePage, J. P., Mogge, N. L., & Sharpe, W. R. (2001). Validity rates of the MMPI-2 and PAI in a rural inpatient psychiatric facility. *Assessment*, *8*, 67-74.

Link, B. G., Andrews, H., & Cullen, F. T. (1992). The violent and illegal behavior of mental patients reconsidered. *American Sociological Review*, *57*, 275-292.

Link, B. G., & Steuve, A. (1994). Psychotic symptoms and the violent/illegal behavior of mental patients compared to community controls. In J. Monahan and H. J. Steadman (Eds.), *Violence and mental disorder: Developments and risk assessment* (pp. 137-160). Chicago: University of Chicago.

Link, B. G., & Stueve, A. (1995). Evidence bearing on mental illness as a possible cause of violent behavior. *Epidemiological Review*, *17*, 172-181.

Link, B. G., Stueve, A., & Phelan, J. (1998). Psychotic symptoms and violent behaviors: Probing the components of threat/control-override symptoms. *Social Psychiatry and Psychiatric Epidemiology*, *33*, S55-S60.

Lo, C. C., & Stephens, R. C. (2000). Drugs and prisoners: Treatment needs on entering prison. *American Journal of Drug and Alcohol Abuse*, *26*, 229-245.

Louscher, P. K., Hosford, R. E., & Moss, C. S. (1983). Predicting dangerous behavior in a penitentiary using the Megargee typology. *Criminal Justice and Behavior, 10*, 269-284.

Loza, W. (1996). Self Appraisal Questionnaire (SAQ): A tool for assessing violent and nonviolent recidivism. Unpublished manuscript.

Loza, W. (2003). Predicting violent and nonviolent recidivism of incarcerated male offenders. *Aggression and Violent Behavior, 8*, 175-203.

Loza, W., Conley, M., & Warren, B. (2004). Concurrent cross-validation of the Self-Appraisal Questionnaire: A tool for assessing violent and nonviolent recidivism and institutional adjustment on a sample of North Carolina Offenders. *International Journal of Offender Therapy and Comparative Criminology*, *48*, 85-95.

Loza, W., & Dhaliwal, G. K. (2005). Predicting violence among forensic-correctional populations: The past 2 decades of advancements and future endeavors. *Journal of Interpersonal Violence, 20*, 188-194.

Loza, W., Dhaliwal, G., Kroner, D. G., & Loza-Fanous, A. (2000). Reliability, construct, and concurrent validities of the Self-Appraisal Questionnaire: A tool for assessing violent and nonviolent recidivism. *Criminal Justice and Behavior*, *27*, 356-374.

Loza, W., & Loza-Fanous, A. (2000). Predictive validity of the Self-Appraisal Questionnaire (SAQ): A tool for assessing violent and nonviolent release failures. *Journal of Interpersonal Violence*, *15*, 1183-1191.

Loza, W., & Loza-Fanous, A. (2001). The effectiveness of the Self-Appraisal Questionnaire in predicting offenders' postrelease outcome: A comparison study. *Criminal Justice and Behavior*, *28*, 105-121.

Loza, W., & Loza-Fanous, A. (2002). The effectiveness of the Self-Appraisal Questionnaire as an offenders' classification measure. *Journal of Interpersonal Violence*, *17*, 3-13.

Loza, W., Neo, L. E., Shahinfar, A., Loza-Fanous, A. (2005). Cross-validation of the Self-Appraisal Questionnaire: A tool for assessing violent and nonviolent recidivism with female offenders. *International Journal of Offender Therapy and Comparative Criminology*, *49*, 547-560.

Loza, W., & Simourd, D. J. (1994). Psychometric evaluation of the Level of Supervision Inventory (LSI) among male Canadian federal offenders. *Criminal Justice and Behavior*, *21*, 468-480.

Loza, W., Villeneuve, D. B., & Loza-Fanous, A. (2002). Predictive validity of the Violence Risk Appraisal Guide: A tool for assessing violent offender's recidivism. *International Journal of Law and Psychiatry, 25,* 85-92.

Lynam, D. R., Caspi, A., Moffit, T. E., Wikström, P. H., Loeber, R., & Novak, S. (2000). The interaction between impulsivity and neighborhood context on offending: The effects of impulsivity are stronger in poorer neighborhoods. *Journal of Abnormal Psychology*, 109, 561-574.

MacKenzie, D. L. (1987). Age and adjustment to prison: Interactions with attitudes and anxiety. *Criminal Justice and Behavior*, *14,* 427-447.

Malik, N. M., & Lindahl, K. M. (1998). Aggression and dominance: The roles of power and culture in domestic violence. *Clinical Psychology: Science and Practice*, *5,* 409-423.

Marlowe, D. B., Festinger, D. S., Kirby, K. C., Rubenstein, D. F., & Platt, J. J. (1998). Congruence of the MCMI-II and MCMI-III in cocaine dependence. *Journal of Personality Assessment*, *71*, 15-28.

Maghan, J. (1999). Dangerous inmates: Maximum security incarceration in the state prison systems of the United States. *Aggression and Violent Behavior*, *1*, 1-12.

McCann, J. T. (2002). Guidelines for forensic application of the MCMI-III. *Journal of Forensic Psychology Practice*, *2*(3), 55-69.

McCorkle, R. C. (1993). Living on the edge: Fear in a maximum-security prison. *Journal of Offender Rehabilitation*, *20*, 73-91.

McCorkle, R. C. (1995). Gender, psychopathology, and institutional behavior: A comparison of male and female mentally ill prison inmates. *Journal of Criminal Justice*, *23*, 53-61.

McKenzle, B., & Curr, H. (2005). Predicting violence in a medium secure setting: A study using the Historical and Clinical Scales of the HCR-20. *British Journal of Forensic Practice, 7,* 22-28.

McNiel, D. E., Gregory, A. L., Lam, J. N., Binder, R. L., & Sullivan, G. R. (2003). Utility of decision support tools for assessing acute risk of violence. *Journal of Consulting and Clinical Psychology*, *71*, 945-953.

McShane, M. (1989). The bus stop revisited: Discipline and psychiatric patients in prison. *Journal of Psychiatry and Law, 17*, 414-433.

Megargee, E. I. (1994). Using the Megargee MMPI-based classification system with MMPI-2s of male prison inmates. *Psychological Assessment,* 6, 337-344.

Megargee, E. I. (1997). Using the Megargee MMPI-based classification system with MMPI-2s of female prison inmates. *Psychological Assessment,* 9, 75-82.

Megargee, E. I. (2006). Use of the MMPI-2 in correctional settings. In J. N. Butcher (Ed.), *MMPI-2: A practitioner's guide* (pp. 327-360).Washington, DC: American Psychological Association.

Megargee, E. I., & Bohn, M. J., Jr. (1979). *Classifying criminal offenders: A new system based on the MMPI*. Beverly Hills, CA: Sage.

Megargee, E. I., & Carbonell, J. L. (1985). Predicting prison adjustment with MMPI correctional scales. *Journal of Clinical and Consulting Psychology, 53,* 874-883.

Megargee, E. I., Mercer, S. J., & Carbonell, J. L. (1999). MMPI-2 with male and female state and federal prison inmates. *Psychological Assessment*, *11*, 177-185.

Menzies, R., Webster, C. D., McMain, S., Staley, S., & Seaglione, R. (1994). The dimensions of dangerousness revisited: Assessing forensic predictions about violence. *Law and Human Behavior, 18*, 1-28.

Mertler, C. A., & Vannatta, R. A. (2005). *Advanced and multivariate statistical methods: Practical applications and interpretation* (3rd ed.). Glendale, CA: Pyrczak.

Millon, T. (1981). *Manual for the Millon Clinical Multiaxial* Inventory. Minneapolis, MN: National Computer Systems.

Millon, T. (1987). *Manual for the Millon Clinical Multiaxial Inventory—II*. Minneapolis, MN: National Computer Systems.

Millon, T., Davis, R. D., & Millon, C. (1997). *Manual for the Millon Clinical Multiaxial Inventory—III* (2nd ed.). Minneapolis, MN: National Computer Systems.

Millon, C. M., & Millon, T. (1997). Using the MCMI in correctional settings. In T. Millon (Ed.), *The Millon Inventories: Clinical and personality assessment* (pp. 140-153). New York: Guilford.

Millon, T., Millon, C., & Davis, R. D. (1994). *Manual for the Millon Clinical Multiaxial Inventory—III*. Minneapolis, MN: National Computer Systems.

Mills, J. F., & Kroner, D. G. (2003). Anger as a predictor of institutional misconduct and recidivism in a sample of violent offenders. *Journal of Interpersonal Violence, 18*, 282-294.

Mills, J. F., Loza, W., & Kroner, D. G. (2003). Predictive validity despite social desirability: Evidence for the robustness of self-report among offenders. *Criminal Behaviour and Mental Health, 13*, 140-150.

Mills, J. F., Jones, M. N., & Kroner, D. G. (2005). An examination of the generalizability of the LSI-R and VRAG probability bins. *Criminal Justice and Behavior, 32*, 565-585.

Monahan, J. (1981). *The clinical prediction of violent behavior*. Washington, DC: National Institute of Mental Health.

Monahan, J. (1992). Mental disorder and violent behavior: Perceptions and evidence. *American Psychologist*, *47*, 511-521.

Monahan, J. (1996). Violence prediction: The past twenty years and the next twenty years. *Criminal Justice and Behavior, 23*, 107-120.

Monahan, J. (2001). Major mental disorder and violence: Epidemiology and risk assessment. In. G. F. Pinard & L. Pagani (Eds.), *Clinical assessment of dangerousness: Empirical contributions* (pp. 89-102). Cambridge, United Kingdom: University of Cambridge Press.

Monahan, J., & Steadman, H. J. (1983). Crime and mental disorder: An epidemiological approach. In M. Tonry & N. Morris (Eds.), *Crime and justice: An annual review of research*, (Vol. 4, pp.145-189). Chicago: University of Chicago Press.

Monahan, J., & Steadman, H. J. (1994). Toward a rejuvenation of risk assessment research. In J. Monahan and H. J. Steadman (Eds.), *Violence and mental disorder: Developments and risk assessment* (pp. 1-18). Chicago: University of Chicago.

Monahan, J. M., & Steadman, H. J. (1996). Violent storms and violent people: How meteorology can inform risk communication in mental health law. *American Psychologist*, *51*, 931-938.

Monahan, J. M., Steadman, H. J., Silver, E., Appelbaum, P. S., Robbins, P. C., Mulvey, E. P., et al. (2001). *Rethinking risk assessment: The MacArthur Study of Mental Disorder and Violence*. New York: Oxford.

Morey, L. C. (1991). The *Personality Assessment Inventory professional manual.* Odessa, FL: Psychological Assessment Resources.

Morey, L. C. (1995). Critical issues in construct validation: Comment on Boyle and Lennon (1994). *Journal of Psychopathology and Behavioral Assessment*, *17*, 393-401.

Morey, L. C. (1996). *An interpretive guide to the Personality Assessment Inventory (PAI)*. Odessa, FL: Psychological Assessment Resources

Morey, L. C. (2003). *Essentials of PAI Assessment*. Hoboken, NJ: John Wiley & Sons.

Morey, L. C., & Lanier, V.W. (1998). Operating characteristics of six response distortion indicators for the Personality Assessment Inventory. *Assessment*, *5*, 203-214.

Morey, L. C., & Hopwood, C. J. (2004). Efficiency of a strategy for detecting back random responding on the Personality Assessment Inventory. *Assessment*, *16*, 197-200.

Morey, L. C., & Quigley, B. D. (2002). The use of the Personality Assessment Inventory (PAI) in assessing offenders. *International Journal of Offender Therapy and Comparative Criminology*, *46*, 333-349.

Morgan, D. W., Edwards, A. C., & Faulkner, L. R. (1993). The adaptation to prison by individuals with schizophrenia. *Bulletin of the American Academy of Psychiatry and Law*, *21*, 427-433.

Moreland, K. L., & Onstad, J. A. (1987). Validity of Millon's computerized interpretation system for the MCMI: A controlled study. *Journal of Consulting and Clinical Psychology*, *55*, 113-114.

Mossman, D. (1994). Assessing predictions of violence: Being accurate about accuracy. *Journal of Consulting and Clinical Psychology*, *62*, 783-792.

Muirhead, J. E., & Rhodes, R. (1998). Literacy levels of Canadian federal offenders. *Journal of Correctional Education*, *49*, 59-60.

Mulvey, E. P., Shaw, E., & Lidz, C.W. (1994). Editorial: Why use multiple sources in research on patient violence in the community. *Criminal Behaviour and Mental Health*, *4*, 253-258.

Nacci, P. L., Teitelbaum, H. E., & Pranther, J. (1977). Population density and inmate misconduct rates in the federal prison system. *Federal Probation*, *41*(2), 26-31.

Novaco, R W. (1994). Anger as a risk factor for violence among the mentally disordered. In J. Monahan and H. J. Steadman (Eds.), *Violence and mental disorder: Developments and risk assessment* (pp. 21-60). Chicago: University of Chicago.

Neumann, C. S., Vitacco, M. J., Hare, R. D., & Wupperman, P. (2005). Reconstructing the reconstruction of psychopathy: A coment on Cooke, Michie, Hart, and Clark. *Journal of Personality Disorders, 19*, 624-640.

Nichols, D. S. (2001). *Essentials of MMPI-2 assessment*. New York: John Wiley & Sons.

Nichols, T. L., Ogloff, J. R. P., & Douglas, K. S. (2004). Assessing Risk for Violence Among Male and Female Civil Psychiatric Patients: The HCR-20, PCL:SV, and VSC. *Behavioral Sciences and the Law*, *22*, 127-158.

Norlander, B., & Eckhardt, C. (2005). Anger, hostility, and male perpetrators of intimate partner violence: A meta-analytical review. *Clinical Psychology Review*, *25*, 119-152.

Norman, D. N., Blais, M. A., & Herzog, D. (1993). Personality characteristics of eating-disordered patients as identified by the Millon Clinical Multiaxial Inventory. *Journal of Personality Disorders*, *7*, 1-9.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd ed.). New York: McGraw-Hill.

Oregon Department of Corrections. (2002). *Handbook for rules of prohibited conduct*. Salem, OR: Author.

Osberg, T. M., & Poland, D. L. (2001). Validity of the MMPI-2 basic and Harris-Lingoes subscales in a forensic sample. *Journal of Clinical Psychology*, *57*, 1369-1380.

Panton, J. H. (1958). Predicting prison adjustment with the Minnesota Multiphasic Personality Inventory, *Journal of Clinical Psychology*, *14*, 308-312.

Panton, J. H. (1960). A new MMPI scale for the identification of homosexuality. *Journal of Clinical Psychology*, *16*, 17-22.

Panton, J. H. (1962a). The identification of habitual criminalism with the MMPI. *Journal of Clinical Psychology*, *18*, 133-63-67.

Panton, J. H. (1962b). Use of the MMPI as an index to successful parole. *Journal of Criminal Law, Criminology, and Police Science*, *53*, 484-488.

Panton, J. H. (1979). An MMPI item content scale to measure religious identification within a state prison population. *Journal of Clinical Psychology*, *35*, 588-591.

Parker, J. D., Daleiden, E. L., & Simpson, C. A. (1999). Personality Assessment Inventory substance use scales: Convergent and discriminant relations with the Addiction Severity Index in a residential chemical dependence treatment center. *Psychological Assessment*, *11*, 507-513.

Patrick, C. J., Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Benning, S. D. (2006). Construct validity of the psychopathic personality inventory two-factor model with offenders. *Psychological Assessment, 18*, 204-208.

Pavkov, T. W., Lewis, D. A., & Lyons, J. S. (1989). Psychiatric diagnosis and racial biases: An empirical investigation. *Professional Psychology: Research and Practice, 20*, 364-368.

Peebles, J., & Moore, R. J. (1998). Detecting socially desirable responding with the Personality Assessment Inventory: The Positive Impression Management Scale and the Defensive Index. *Journal of Clinical Psychology, 54*, 621-628.

Phelan, J. C., & Link, B. G. (1998). The growing belief that people with mental illnesses are violent: The role of the dangerousness criterion for civil commitment. *Social Psychiatry and Psychiatric Epidemiology, 33,* S7-S12.

Piersma, H. L., & Boes, J. L. (1997). MCMI-III as a treatment outcome measure for psychiatric inpatients. *Journal of Clinical Psychology*, *53*, 825-831.

Pinard, G. F., & Pagani, L. (2001). Discussion and clinical commentary. In G. F. Pinard & L. Pagani (Eds.), *Clinical assessment of dangerousness: Empirical contributions* (pp. 258-278). Cambridge, UK: Cambridge University Press.

Piotrowski, C. (2000). How popular is the Personality Assessment Inventory in practice and training? *Psychological Reports, 86*, 65-66.

Piotrowski, C., & Belter, R. W. (1999). Internship training in psychological assessment: Has managed care had an impact? *Assessment*, *6*, 381-389.

Plutchik, R. (1995). Outward and inward directed aggressiveness: The interaction between violence and suicidality. *Pharmacopsychiatry*, (*Supp 1)*, 47-57.

Poythress, N. G., Edens, J. F., & Lilienfeld, S. O. (1998). Criterion related validity of the psychopathic personality inventory in a prison sample. *Psychological Assessment*, *10*, 426-430.

Proctor, J. L. (1994). Evaluating a modified version of the federal prison system's inmate classification model: An assessment of objectivity and predictive validity. *Criminal Justice and Behavior, 21*, 256-272.

Quay, H. C. (1984). *Managing adult inmates: Classification for housing and program assignments*. College Park, MD: American Correctional Association, U.S. Department of Justice.

Quinsey, V. L., Harris, G. T., Rice, M. E., & Cormier, C. A. (1998). *Violent Offenders: Appraising and managing risk*. Washington, DC: American Psychological Association.

Quinsey, V. L., Harris, G. T., Rice, M. E., & Cormier, C. A. (2006). *Violent offenders: Appraising and managing risk* (2nd ed.). Washington, DC: American Psychological Association.

Ramos v. Lamm, 520 F. Supp. 1059 (D. Colo. 1981).

Retzlaff, P. (1996). MCMI-III diagnostic validity: Bad test or bad validity study? *Journal of Personality Assessment*, *66*, 431-437.

Retzlaff, P. (2000). Comment on the validity of the MCMI-III. *Law and Human Behavior*, *24*, 499-500.

Retzlaff, P., Stoner, J., & Kleinsasser, D. (2002). The use of the MCMI-III in the screening and triage of offenders. *International Journal of Offender Therapy and Comparative Criminology*, *46*, 319-332.

Rice, M. E., & Harris, G. T. (1992). A comparison of criminal recidivism among schizophrenic and nonschizophrenic offenders. *International Journal of Law and Psychiatry*, *15*, 397-408.

Rice, M. E., & Harris, G. T. (1997). Cross-validation and extension of the Violence Risk Appraisal Guide for child molesters and rapists. *Law and Human Behavior*, *21*, 231-241.

Rice, M. E., & Harris, G. T. (2005). Comparing effect sizes in follow-up studies: ROC area, Cohen's *d* and *r*. *Law and Human Behavior*, *29*, 615-620.

Robins, L. N., Tipp, J., & Przybeck, T. (1991). Antisocial personality disorder. In L. N Robins & D. A. Regier (Eds.), *Psychiatric disorders in America: The Epidemiologic Catchment Area Study* (pp. 258-290). New York: Free Press.

Robins, L. N., & Regier, D. A. (Eds.). (1991). *Psychiatric disorders in America: The Epidemiologic Catchment Area Study*. New York: Free Press.

Rogers, R. (1997). Introduction. In R. Rogers (Ed.) *Clinical assessment of malingering and deception* (2nd ed., pp. 1-22). New York: Guilford.

Rogers, R. (2000). The uncritical acceptance of risk assessment in forensic practice. *Law and Human Behavior*, *24*, 595-605.

Rogers, R. (2003). Forensic use and abuse of psychological tests: Multiscale inventories. *Journal of Psychiatric Practice*, *9*, 316-320.

Rogers, R., & Dion, K. (1991). Rethinking the *DSM-III-R* diagnosis of antisocial personality disorder. *Bulletin of the American Academy of Psychiatry and Law, 19*, 21-31.

Rogers, R., Duncan, J. C., Lynett, & Sewell, K. W. (1994). Prototypical analysis of antisocial personality disorder: *DSM-IV* and beyond. *Law and Human Behavior, 18*, 471-484.

Rogers, R., Flores, J., Ustad, K., & Sewell, K. W. (1995). Initial validation of the Personality Assessment Inventory- Spanish version with clients from Mexican-American communities. *Journal of Personality Assessment, 64*, 340-348.

Rogers, R., Salekin, R. T., & Sewell, K. W. (1999). Validation of the Millon Clinical Multaxial Inventory for Axis II disorders: Does it meet the *Daubert* standard? *Law and Human Behavior, 23,* 425-443.

Rogers, R. Salekin, R. T., & Sewell, K. W. (2000). The MCMI-III and the *Daubert* standard: Separating rhetoric from reality. *Law and Human Behavior, 24,* 501-506.

Rogers, R., Sewell, K. W., Cruise, K. R., Wang, E. W., & Ustad, K. L. (1998). The PAI and feigning: A cautionary note on its use in forensic-correctional settings. *Assessment, 5,* 399-405.

Rogers, R., Sewell, K. W., Morey, L. C., & Ustad, K. L. (1996). Detection of feigned mental disorders on the Personality Assessment Inventory: A discriminant analysis. *Journal of Personality Assessment, 67*, 629-640.

Rogers, R. Ustad, K. L., & Salekin, R. T. (1998). Convergent validity of the Personality Assessment Inventory: A study of emergency referrals in a correctional setting. *Assessment*, 5, 3-12.

Ruback, R. B., & Innes, C. A. (1988). Relevance and irrelevance of psychological research: The example of prison overcrowding. *American Psychologist, 43*, 683-693.

Saldano v. Texas, 530 U.S. 1212 (2000).

Salekin, R. T., Rogers, R., & Sewell, K. W. (1996). A review and meta-analysis of the Psychopathy Checklist and Psychopathy Checklist-Revised: Predictive validity of dangerousness. *Clinical Psychology: Science and Practice, 3*, 203-215.

Salekin, R. T., Rogers, R., Ustad, K. L., & Sewell, K. W. (1998). Psychopathy and recidivism among female inmates. *Law and Human Behavior, 22*, 109-128.

Sandoval, A. M. R., Hancock, D., Poythress, N., Edens, J. F., & Lilienfeld, S. (2000). Construct validity of the Psychopathic Personality Inventory in a correctional sample. *Journal of Personality Assessment*, *74*, 262-281.

Schaffer, C. E., Jr., Waters, W. F., & Adams, S. G. (1994). Dangerousness: Assessing the risk of violent behavior. *Journal of Consulting and Clinical Psychology*, *62*, 1064-1068.

Schutte, J. W. (2001). Using the MCMI-III in forensic evaluations. *American Journal of Forensic Psychology*, *19(2)*, 5-20.

Serin, R. C., & Amos, N. L. (1995). The role of psychopathy in the assessment of dangerousness. *International Journal of Law and Psychiatry*, *18*, 231-238.

Sorensen, J. R., & Pilgrim, R. L. (2000). An actuarial risk assessment of violence posed by capital murder defendants. *Criminology*, *90*, 1251-1270.

Sorensen, J. R. & Wrinkle, R. D. (1996). No hope for parole: Disciplinary infractions among death-sentenced and life-without-parole inmates. *Criminal Justice and Behavior*, *23*, 542-552.

Spielberger, C. D. (1988). *State-Trait Anger Expression Inventory--Revised Research Edition: Professional Manual*. Odessa, FL: Psychological Assessment Resources.

Steadman, H. J., Mulvey, E. P., Monahan, J. P., Robbins, P. C., Appelbaum, P. S., Grisso, T., et al. (1998). Violence by people discharged from acute psychiatric inpatient facilities and by others in the same neighborhoods. *Archives of General Psychiatry*, *55*, 393-401.

Stevens, G. F. (1994). Prison clinician's perceptions of antisocial personality disorder as a formal diagnosis. *Journal of Offender Rehabilitation*, *20*, 159-185.

Suter, J. M., Byrne, M. K., Howells, K., & Day, A. (2002). Anger in prisoners: Women are different from men. *Personality and Individual Differences*, *32*, 1087-1100.

Swanson, J. W. (1994). Mental disorder, substance abuse, and community violence: An epidemiological approach. In J. Monahan and H. J. Steadman (Eds.), *Violence and mental disorder: Developments and risk assessment* (pp. 101-136). Chicago: University of Chicago.

Swanson, J. W., Borum, R., Swartz, M. S., & Monahan, J. (1996). Psychotic symptoms and disorders and the risk of violent behaviour in the community. *Criminal Behaviour and Mental Health*, *6*, 309-329.

Swanson, J. W., Hollzer III, C. H., Ganju, V. K., & Jono, R. T. (1990). Violence and psychiatric disorder in the community: Evidence from the epidemiologic catchment area surveys. *Hospital and Community Psychiatry*, *41*, 761-770.

Tehrani, J. A., Brennan, P. A., Hodgins, S., & Mednick, S. A. (1998). Mental illness and criminal violence. *Social Psychiatry and Psychiatric Epidemiology*, *33*, S81-S85.

Tengstrom, A. (2001). Long-term predictive validity of historical factors in two risk assessment instruments in a group of violent offenders with schizophrenia. *Nordic Journal of Psychiatry*, *55*, 243-249.

Teplin, L. A., Abram, K. M., & McClelland, G. M. (1994). Does psychiatric disorder predict violent crime among released jail detainees? A six-year longitudinal study. *American Psychologist*, *49*, 335-342.

Toch, H., & Adams, K. (1986). Pathology and disruptiveness among prison inmates. *Journal of Research in Crime and Delinquency*, *28*, 7-21.

Toch, H. & Adams, K. (1987). The prison as dumping ground: Mainlining disturbed offenders. *Journal of Psychiatry and Law*, *15*, 539-553.

Toch, H., & Adams, K. (2002). *Acting out: Maladaptive behavior in confinement.* Washington, DC: American Psychological Association.

Toch, H., Adams, K., & Greene, R. (1987). Ethnicity, disruptiveness, and emotional disorder among prison inmates. *Criminal Justice and Behavior*, *14*, 93-109.

Trull, T. J. (1995). Borderline personality disorder features in nonclinical young adults: 1. Identification and classification. *Psychological Assessment*, *7*, 33-44.

Valliant, P. M., Gristey, C., Pottier, D., & Kosmyna, R. (1999). Risk factors in violent and nonviolent offenders. *Psychological Reports*, *85*, 675-680.

Van Voorhis, P. (1994). *Psychological classification of the adult male prison inmate*. Albany, NY: State University of New York.

Van Voorhis, P., & Brown, K. (1996). *Risk classification in the 1990s*. Washington, DC: National Institute of Corrections, U.S. Department of Justice.

Vitacco, M. J., Neumann, C. S., & Jackson, R. L. (2005). Testing a four-factor model of psychopathy and its association with ethnicity, gender, intelligence, and violence. *Journal of Consulting and Clinical Psychology*, *73*, 466-476.

Vitacco, M. J., Rogers, R., Neuman, C. S., Harrison, K. S., & Vincent, G. (2005). A comparison of factor models on the PCL-R with mentally disordered offenders: The development of a four-factor model. *Criminal Justice and Behavior, 32*, 526-545.

Walters, G. D. (1995). The Psychological Inventory of Criminal Thinking Styles: Part I: Reliability and preliminary validity. *Criminal Justice and Behavior*, *22*, 301-325.

Walters, G. D. (1996). The Psychological Inventory of Criminal Thinking Styles: Part III: Predictive validity. *International Journal of Offender Therapy and Comparative Criminology*, *40*, 105-112.

Walters, G. D. (1998). Time series and correlation analyses of inmate-initiated assaultive incidents in a large correctional system. *International Journal of Offender Therapy and Comparative Criminology*, *42*(2), 124-132.

Walters, G. D. (2002). The Psychological Inventory of Criminal Thinking Styles (PICTS): A review and meta-analysis. *Assessment*, *9*, 278-291.

Walters, G. D. (2003). Predicting institutional adjustment and recidivism with the Psychopathy Checklist factor scores. *Law and Human Behavior*, *27*, 541-558.

Walters, G. D. (2005a). How many factors are there on the PICTS? *Criminal Behaviour and Mental Health*, *15*, 237-283.

Walters, G. D. (2005b). Predicting institutional adjustment with the Lifestyle Criminality Screening Form and Psychological Inventory of Criminal Thinking Styles. *International Journal of Forensic Mental Health*, *4*, 63-70.

Walters, G. D. (2006a). Use of the Psychological Inventory of Criminal Thinking Styles to predict disciplinary adjustment in male inmate program participants. *International Journal of Offender Therapy and Comparative Criminology*, *50*, 166-173.

Walters, G. D. (2006b). Risk-appraisal versus self-report in the prediction of criminal justice outcomes: A meta-analysis. *Criminal Justice and Behavior*, *33*, 279-304.

Walters, G. D., Duncan, S. A., & Geyer, M. D. (2003). Predicting disciplinary adjustment in inmates undergoing forensic evaluation: A direct comparison of the PCL-R and the PAI. *The Journal of Forensic Psychiatry & Psychology, 14*, 382-393.

Walters, G. D., & Elliott, W. N. (1999). Predicting release and disciplinary outcome with the Psychological Inventory of Criminal Thinking Styles: Female data. *Legal and Criminological Psychology*, *4*, 15-21.

Walters, G.D., & Geyer, M. D. (2005). Construct Validity of the Psychological Inventory of Criminal Thinking Styles in relationship to PAI, disciplinary adjustment, and program completion. *Journal of Personality Assessment*, *84*, 252-260.

Walters, G. D., White, T. W., & Denney, D. (1991). The Lifestyle Criminality Screening Form: Preliminary data. *Criminal Justice and Behavior*, *18*, 406-418.

Wang, E. W., Rogers, R., Giles, C. L., Diamond, P., Herrington-Wang, L. E., & Taylor, E. R. (1997). A pilot study of the Personality Assessment Inventory (PAI) in corrections: Assessment of malingering, suicide risk, and aggression in male inmates. *Behavioral Sciences and the Law*, *15*, 469-482.

Wang, E. W., & Diamond, P. M. (1999). Empirically identified factors related to violence risk in corrections. *Behavioral Sciences and the Law*, *17,* 377-389.

Warren, J. L., Burnette, M., South, S. C., Chauhan, P., Bale, R., & Friend, R. (2002). Personality disorders and violence among female prison inmates. *Journal of the American Academy of Psychiatry and the Law*, *30*, 502-509.

Warren, J. L., Hurt, S., Booker-Loper, A., Bale, R., Friend, R., & Chauhan, P. (2002). Psychiatric symptoms, history of victimization, and violent behavior among incarcerated female felons: An American perspective. *International Journal of Law and Psychiatry*, *25*, 129-149.

Watkins, C. E., Campbell, V. L., Nieberding, R., & Hallmark, R. (1995). Contemporary practice of psychological assessment by clinical psychologists. *Professional Psychology, Research, and Practice*, *26*, 54-60.

Wattron, J. B. (1963). A prison maladjustment scale for the MMPI. *Journal of Clinical Psychology*, *19*, 109-110.

Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). *HCR-20: Assessing risk for violence (Version 2)*. Vancouver, BC: Mental Health Law and Policy Institute, Simon Fraser University.

Webster, C. D., Eaves, D., Douglas, K. S., & Wintrup, A. (1995). *The HCR-20 scheme: The assessment of dangerousness and risk*. Vancouver Canada: Simon Fraser University and British Columbia Forensic Psychiatric Services Commission.

Widiger, T. A., & Corbitt, E. M. (1995). Antisocial personality disorder. In W. J. Livesley (Ed.), *The DSM-IV personality disorders* (pp. 103-126). New York: Guilford.

Wright, K. N. (1993). Prison environments and behavioral outcomes. *Journal of Offender Rehabilitation*, *20*, 93-113.

Yudofsky, S. C., Silver, J. M., Jackson, W., Endicott, J., & Williams, D. (1986). The Overt Aggression Scale for the objective rating of verbal and physical aggression. *American Journal of Psychiatry, 143*, 35-39.

Zamble, E. (1992). Behavior and adaptation in long-term prison inmates: Descriptive longitudinal results. *Criminal Justice and Behavior*, *19*, 409-425.

Zager, L. D. (1988). The MMPI based criminal classification system: A review, current status, and future directions. *Criminal Justice and Behavior*, *15*, 39-57.

APPENDIX A

Description of PAI Scales

Scale	Items	Scale Description
Validity Scales		
Inconsistency (ICN)	20	Based on ten pairs of items consisting of highly correlated items. Designed to assess response consistency .
Infrequency (INF)	8	Neutral items with very high or very low endorsement rates. Identifies random and careless responding.
Negative Impression Management (NIM)	9	Designed to identify exaggerated unfavorable portrayals. Made up of bizarre and unlikely symptoms that have a low endorsement rate among clinical populations.
Positive Impression Management (PIM)	9	Items are suggestive of an overly favorable impression or the denial of common/minor faults.

Scale	Items	Scale Description
Clinical Scales		
Somatic Complaints (SOM)	24	Items focus on preoccupation with health issues and somatic complaints consistent with somatization and conversion disorders.
Conversion (SOM-C)	8	Rare symptoms of sensory and motor functioning.
Somatization (SOM-S)	8	Focus on frequent occurrence of common physical symptoms and vauge complaints of poor health.
Health Concerns (SOM-H)	8	Preoccupation with health and physical functioning.
Anxiety (ANX)	24	Items focus on internal experiences and behaviors associated anxiety.
Cognitive (ANX-C)	8	Rumination and concern that impairs attention and concentration.
Affective (ANX-A)	8	Focus on tension, fatigue, and difficulty relaxing as a result of high perceived stress.
Physiological (ANX-P)	8	Overt physical signs of anxiety, tension, and stress.

Scale	Items	Scale Description
Anxiety-Related Disorders (ARD)	24	Items focus on symptoms associated with specific anxiety disorders.
Obesessive-Compulsive (ARD-O)	8	Intrusive thoughts and behaviors, affective constriction, perfectionism.
Phobias (ARD-P)	8	Focus on common fears.
Traumatic Stress (ARD-T)	8	Experience of traumatic event and resulting distress.
Depression (DEP)	24	Items focus on internal experiences and behaviors associated with depressive disorders.
Cognitive (DEP-C)	8	Thoughts associated with depression and concentration problems.
Affective (DEP-A)	8	Anhedonia, subjective feelings of sadness, depressed mood.
Physiological (DEP-P)	8	Physical functioning, energy level, sleep patterns, and appetite.
Mania (MAN)	24	Items focus on symptoms associated with mania and hypomania.
Activity Level (MAN-A)	8	Accelerated thought processes and behaviors.
Grandiosity (MAN-G)	8	Inflated self-esteem and belief that one has unique or special skills/talents.
Irritability (MAN-I)	8	Mood volatility and poor frustration tolerance.

Scale	Items	Scale Description
Paranoia (PAR)	24	Symptoms and enduring characteristics associated with paranoia.
Hypervigilance (PAR-H)	8	Distrust in relationships, suspiciousness, and tendency to monitor environment.
Persecution (PAR-H)	8	Beliefs that others are seeking to undermine/obstruct efforts.
Resentment (PAR-R)	8	Hostility, bitterness, externalizing blame, and grudge holding.
Schizophrenia (SCZ)	24	Items assess symptoms associated with schizophrenia spectrum disorders.
Psychotic Experiences (SCZ-P)	8	Delusional thinking, visual/auditory hallucinations, and bizarre thought content.
Social Detachment (SCZ-S)	8	Social disinterest and awkwardness; lack of affective responsivity.
Thought Disorder (SCZ-T)	8	Clarity of thought processes, confusion, and concentration problems.
Borderline Features (BOR)	24	Items focus on unstable relationships, impulsivity, affective lability/instability, poorly controlled anger.
Affective Instability (BOR-A)	6	Rapid and extreme mood swings.
Identity Problems (BOR-I)	6	Uncertainty about life issues, feelings of emptiness, and feelings of emptiness.
Negative Relationships (BOR-N)	6	Tendency to become involved in tense/chaotic relationships.
Self-Harm (BOR-S)	6	Tendency to act impulsivity with little attention given to consequences.

Scale	Items	Scale Description
Antisocial Features (ANT)	24	Items focus on a history of antisocial/criminal behaviors, egocentrism, lack of empathy, and excitement seeking.
Antisocial Behaviors (ANT-A)	8	Antisocial/criminal acts committed during adolescence and adulthood.
Egocentricity (ANT-E)	8	Callousness and lack of empathy in social interactions.
Stimulus Seeking (ANT-S)	8	Willingness to take risks, low tolerance for boredom, and recklessness.
Alcohol Problems (ALC)	12	Items focus on behaviors and consequences related to alcohol use, abuse, and dependence.
Drug Problems (DRG)	12	Items focus on behaviors and consequences related to drug use, abuse, and dependence.
Treatment Scales		
Aggression (AGG)	18	Items focus on attitudes and behaviors characteristic of anger, hostility, and aggression.
Aggressive Attitude (AGG-A)	6	Includes affective states and attitudes conducive to aggressive behavior.
Verbal Aggression (AGG-V)	6	Reflects readiness to display anger through verbal means.
Physical Aggression (AGG-P)	6	Inquires about past behaviors and present attitudes toward physical aggression.

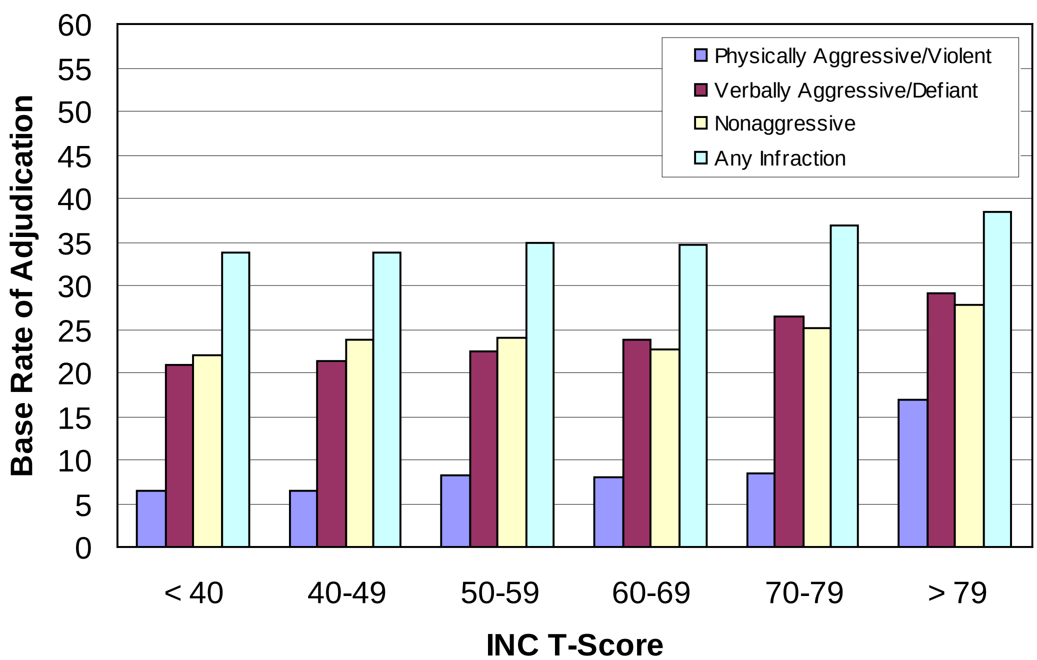
Scale	Items	Scale Description
Suicidal Ideation (SUI)	12	Items focus on a continuum of suicidal thoughts.
Stress (STR)	8	Assessment of impact of current life stressors.
Nonsupport (NON)	8	Items measure perceived lack of social support.
Treatment Rejection (RXR)	8	Designed to assess attitudes that impact motivation for treatment.
Interpersonal Scales		
Dominance (DOM)	12	Assesses the degree to which a person desires to control relationships.
Warmth (WRM)	12	Designed to assess the degree to which a person is supportive and empathic in relationships.

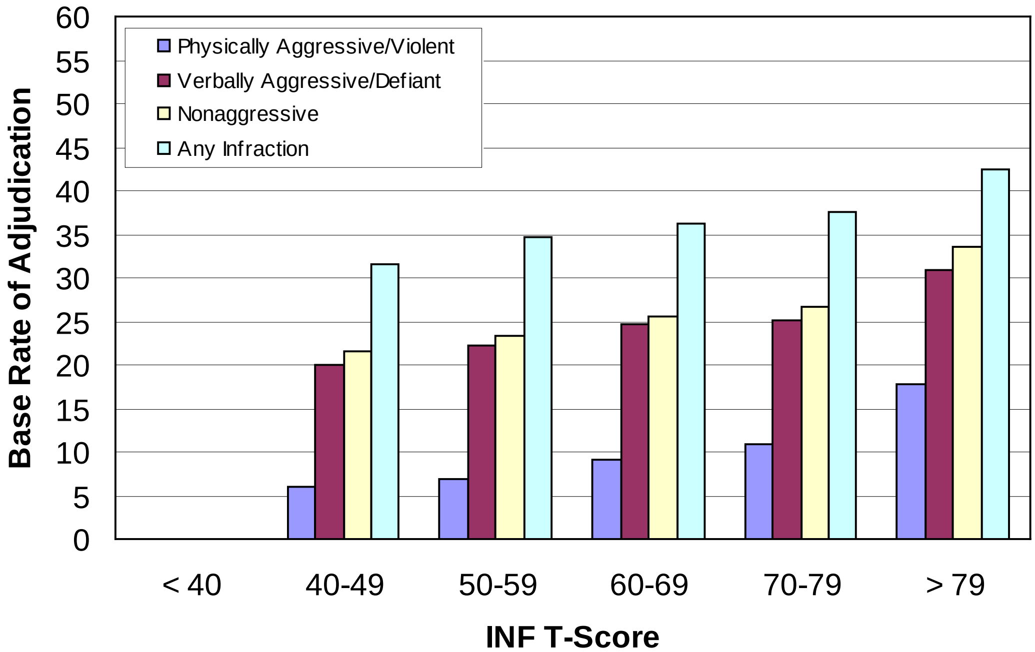
Note. Morey (1991, 1996, 2003).

APPENDIX B

Base Rates of Adjudication According to PAI Major Scale Elevations and PAI-Related Variables

PAI Validity Scales (*N* = 17,054)

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Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
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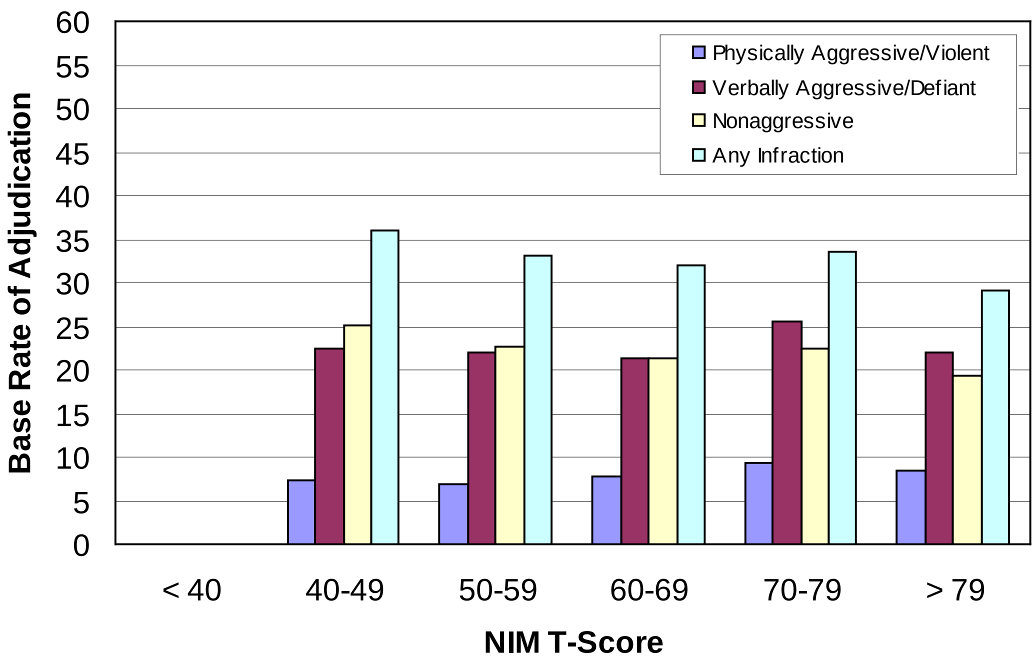
INF T-Score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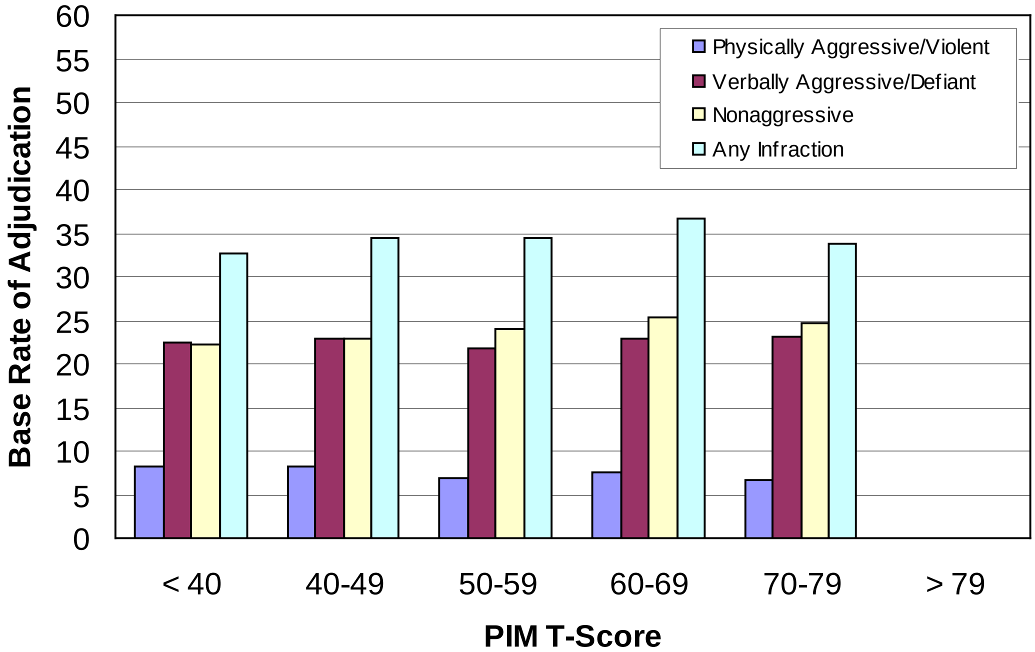
NIM T-Score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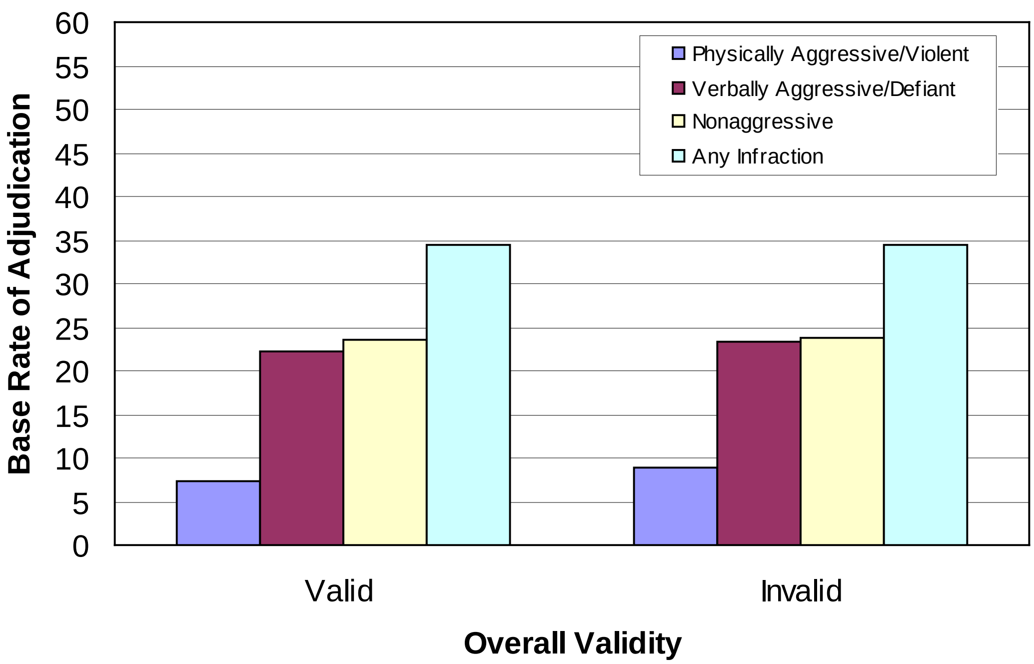
PIM T-Score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Valid
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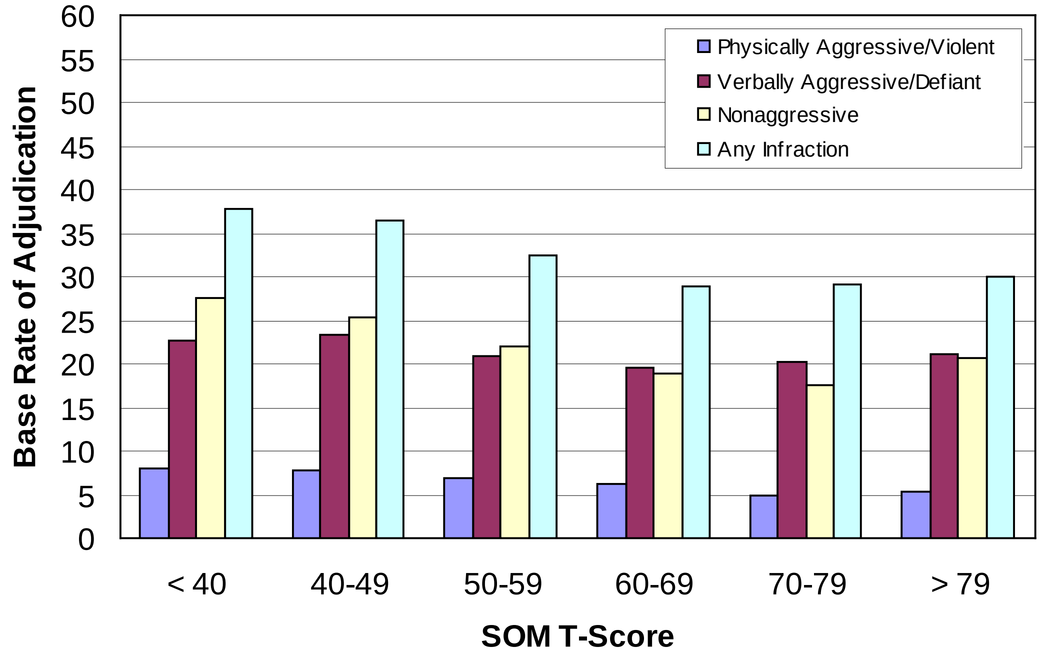
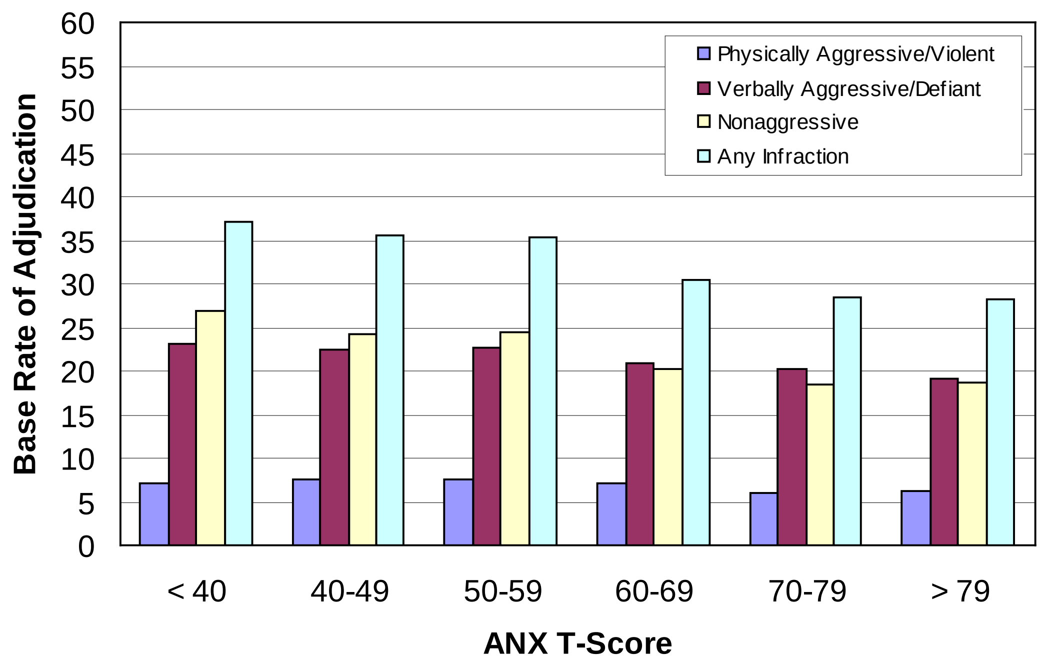
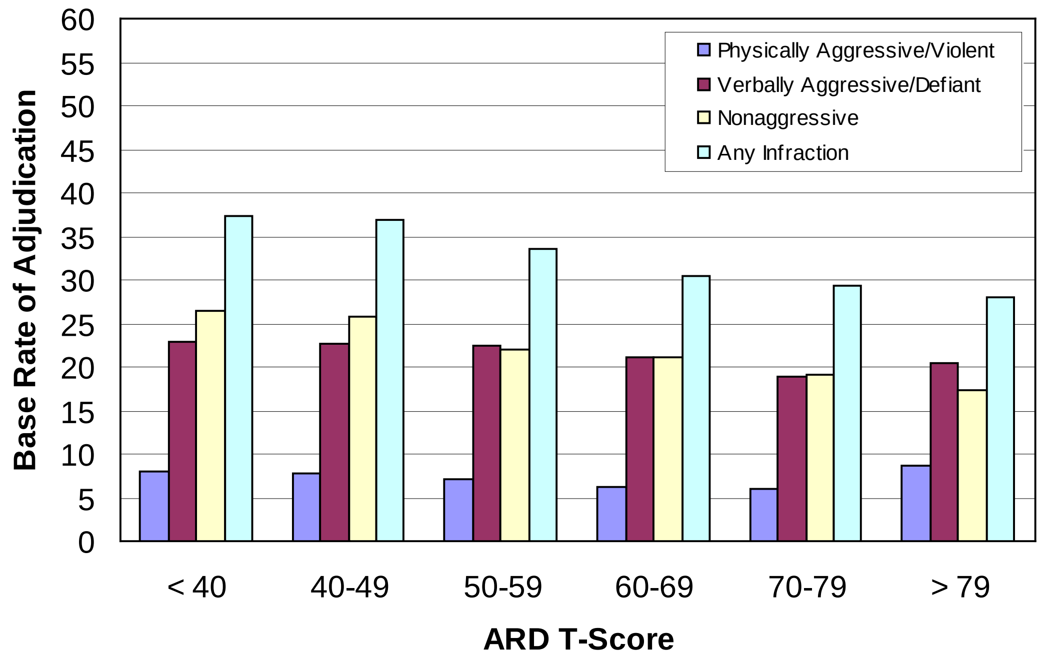
Overall Validity

PAI Clinical Scales (*N* = 14,671)







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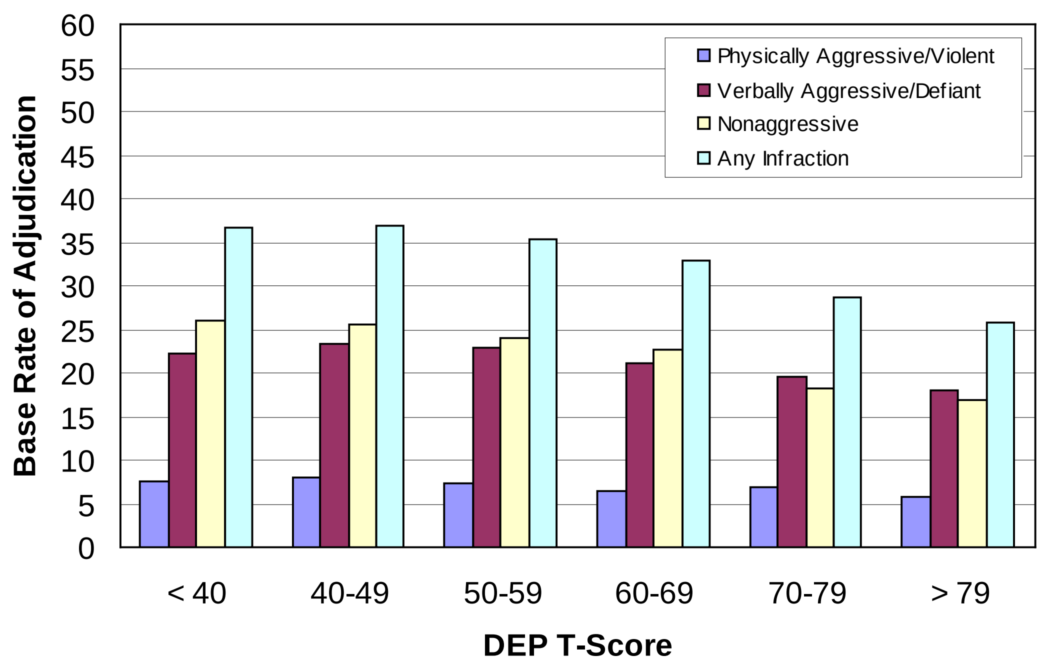
ARD T-Score



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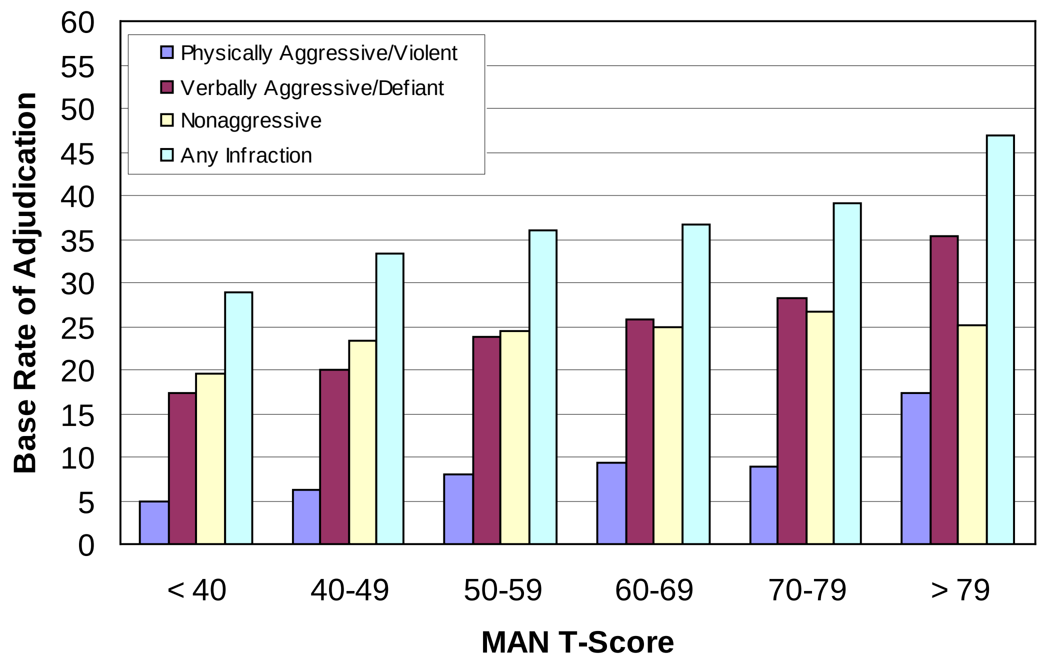
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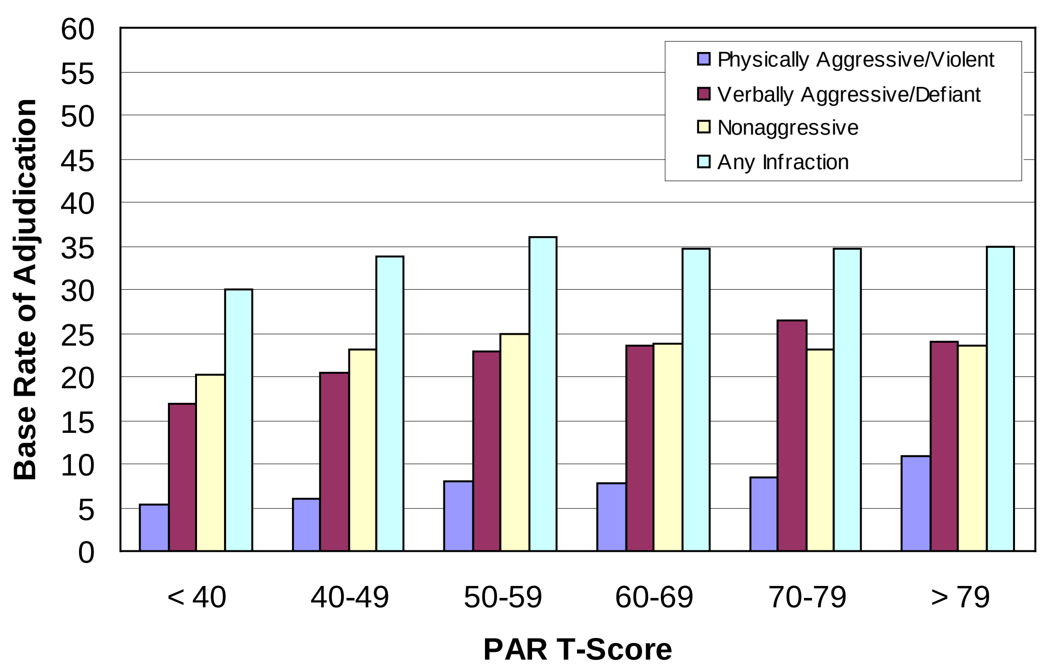
MAN T-Score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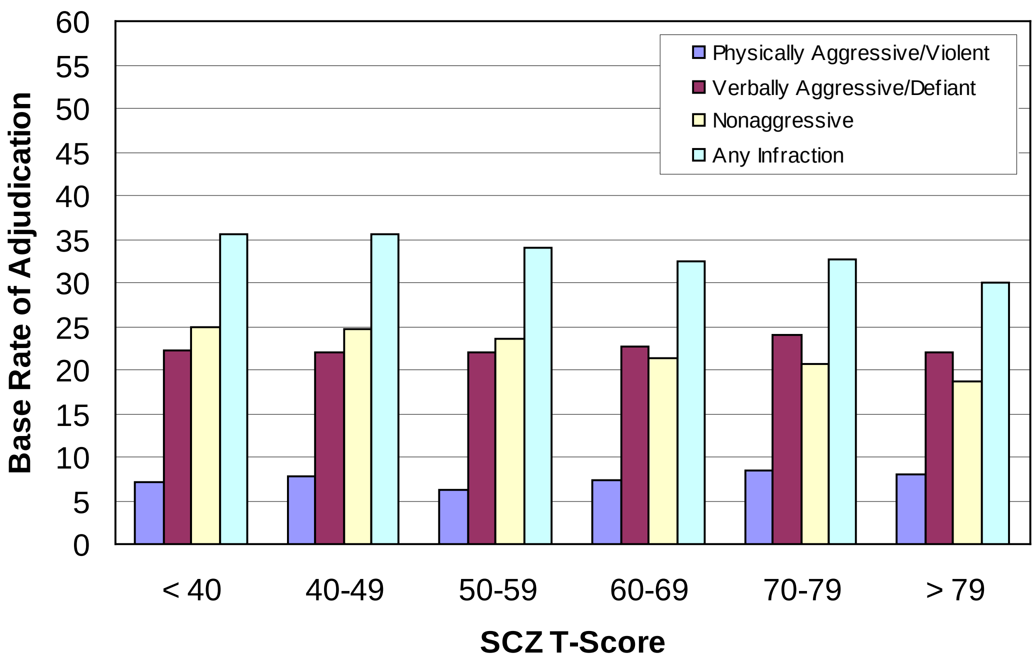
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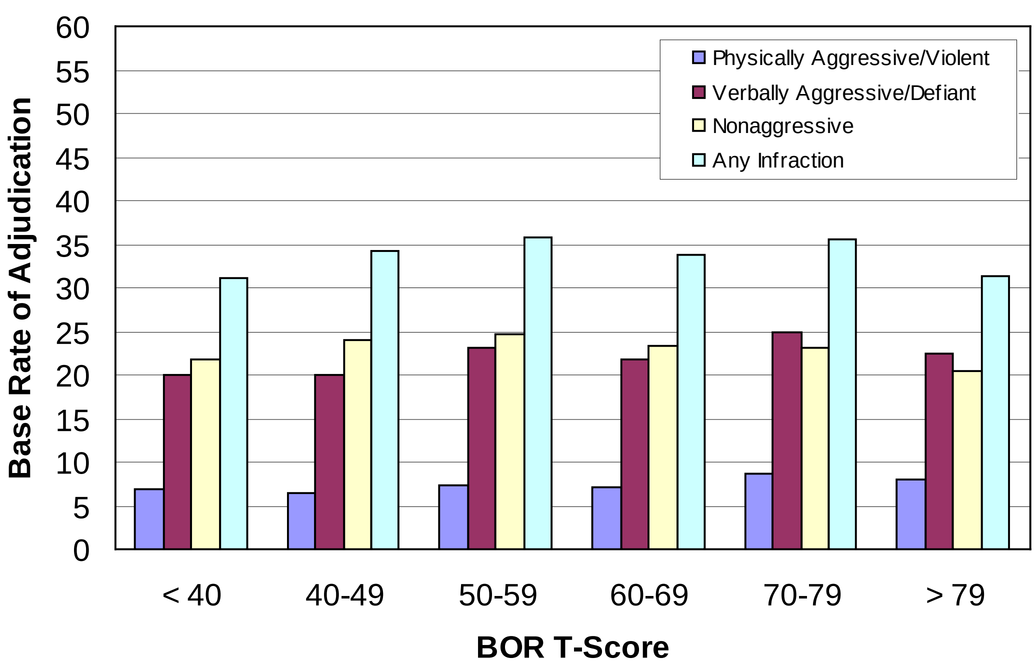
SCZ T-Score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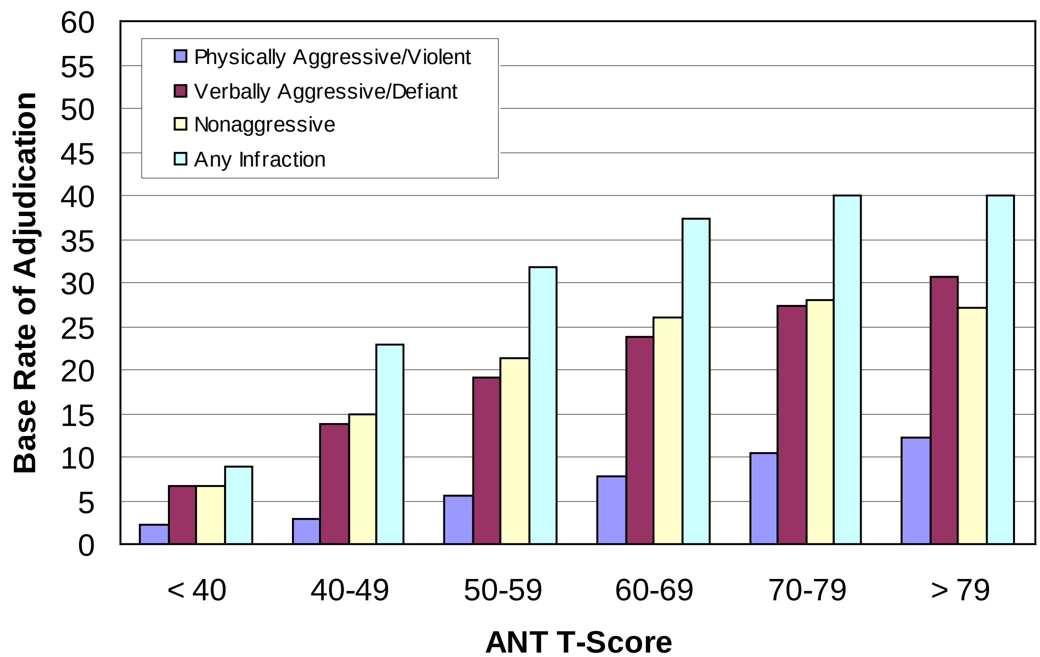
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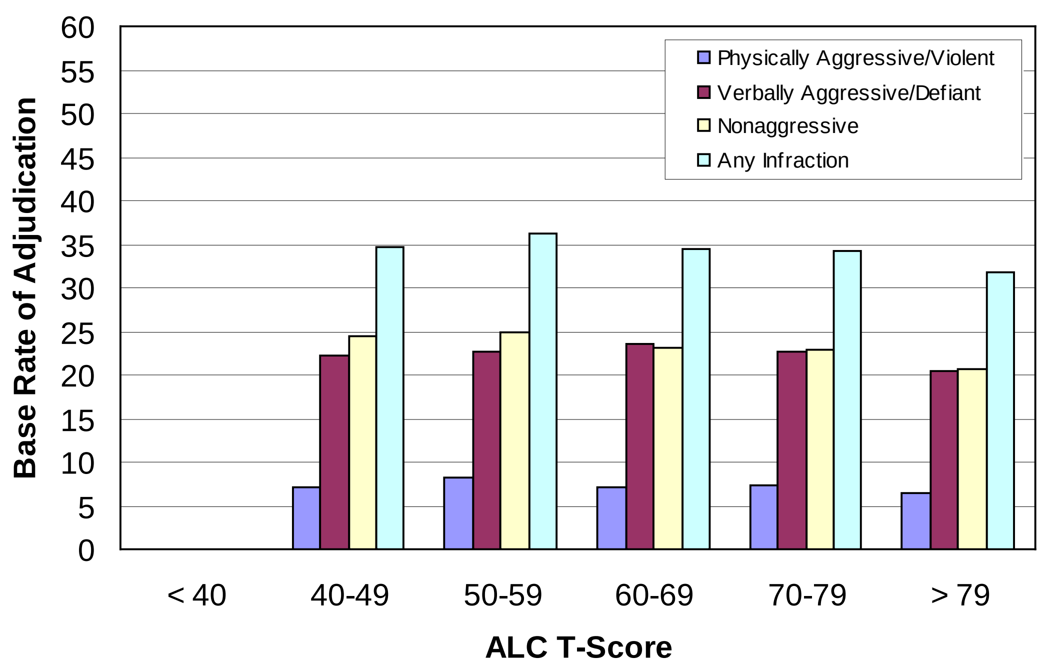
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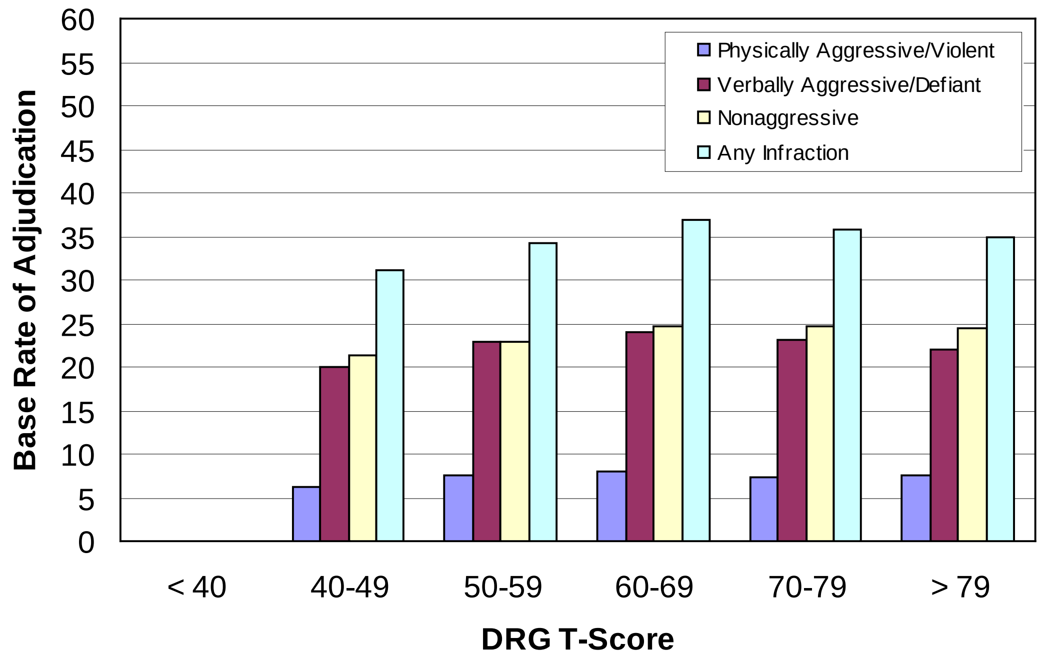
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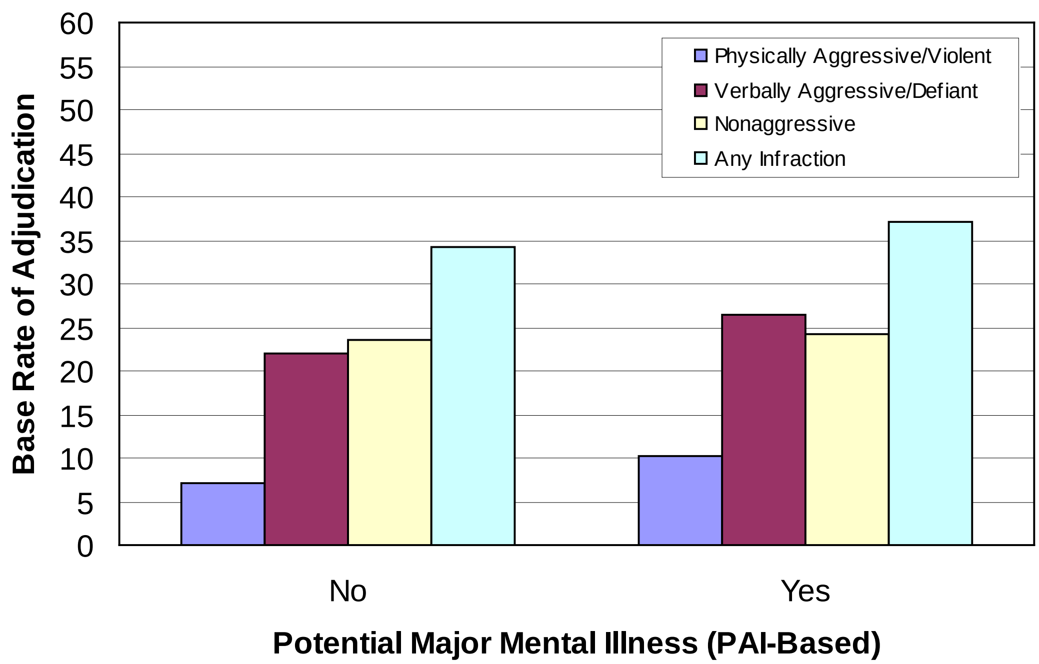
DRG T-Score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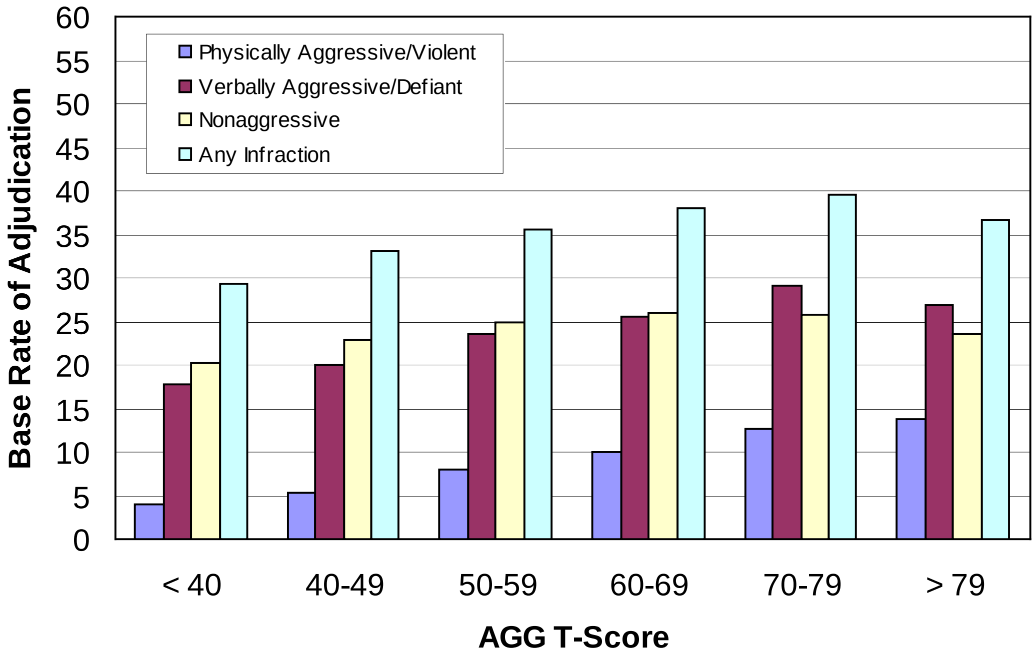
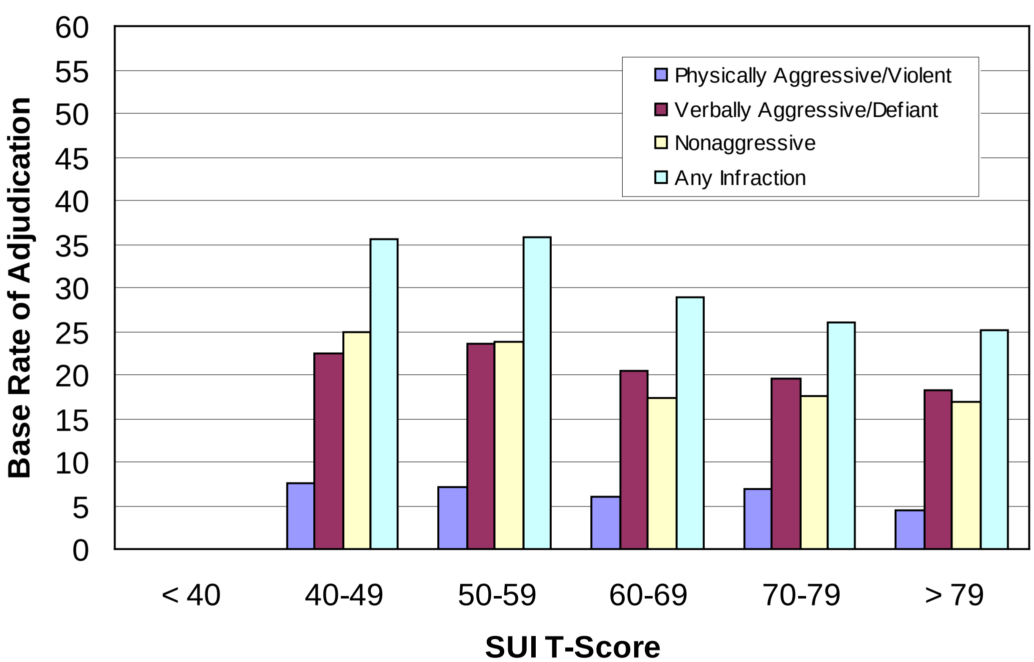
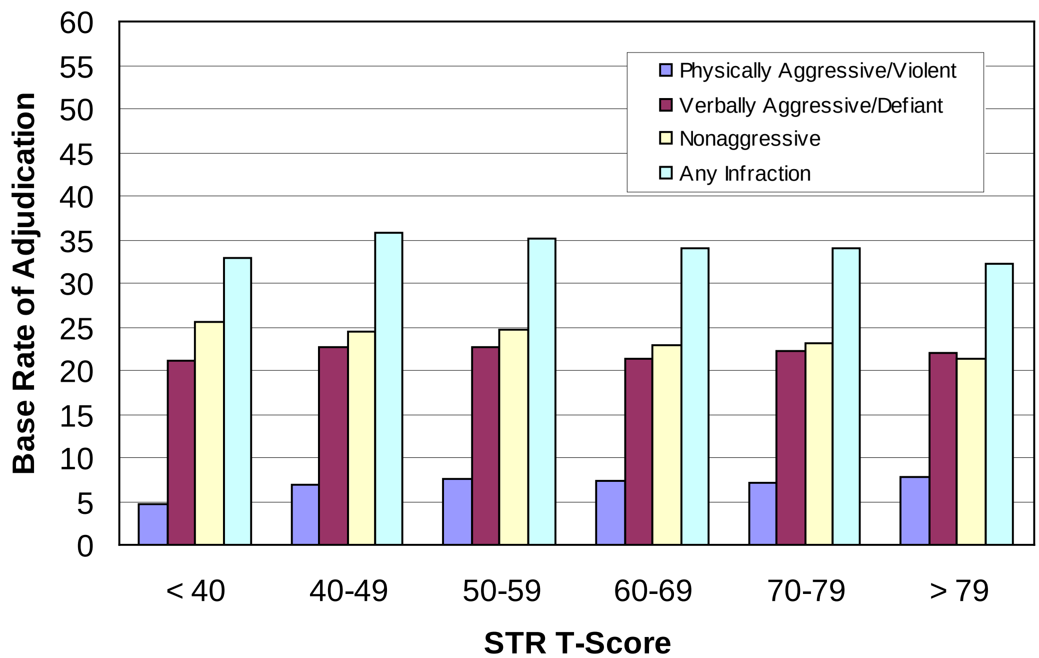
Potential Major Mental Illness (PAI-Based)

PAI Treatment Scales (*N* = 14,671)



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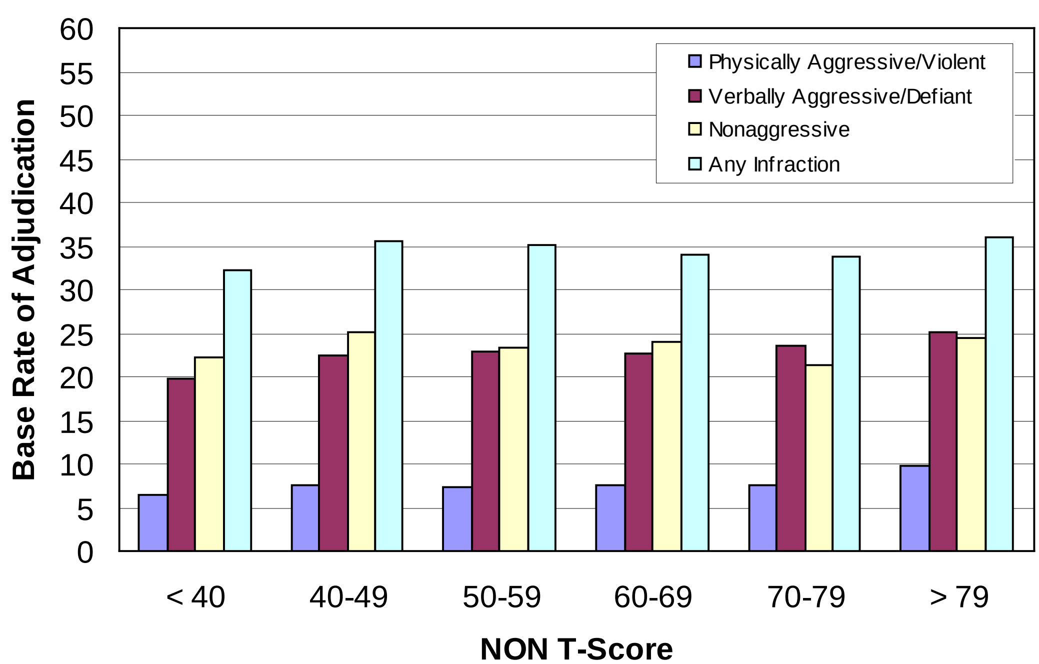
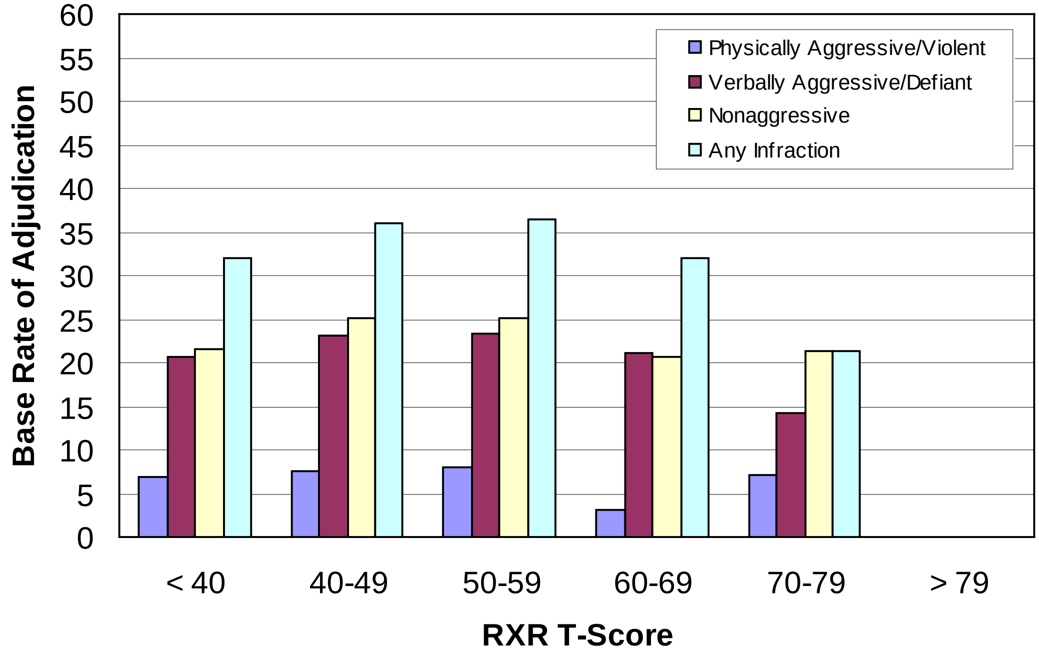
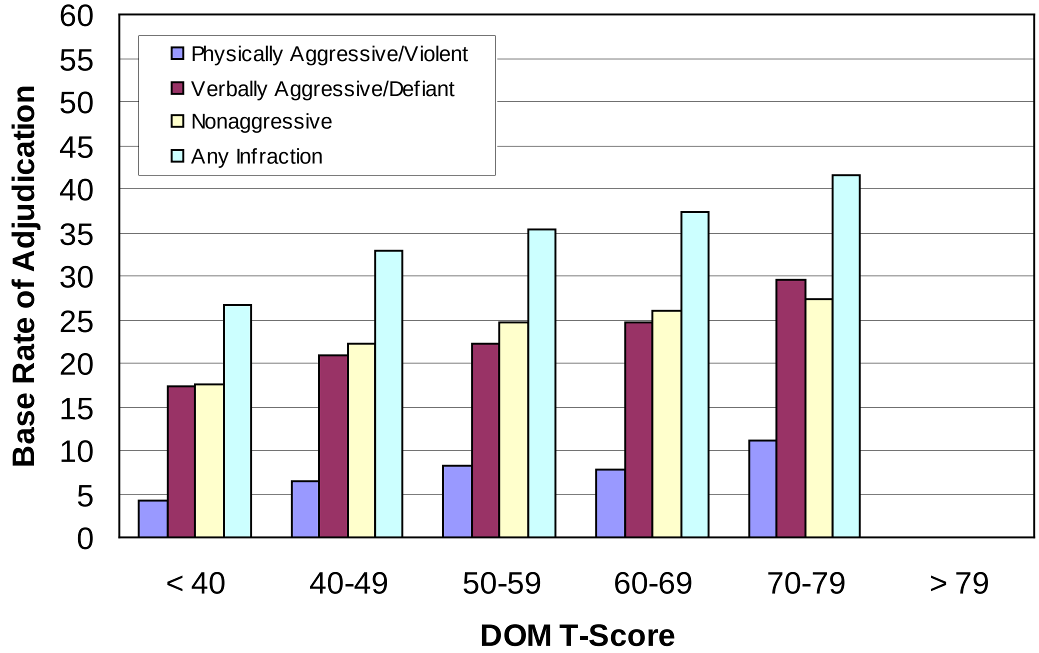
Base Rate of Adjudication
Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
< 40
40-49
50-59
60-69
70-79
> 79
STR T-Score

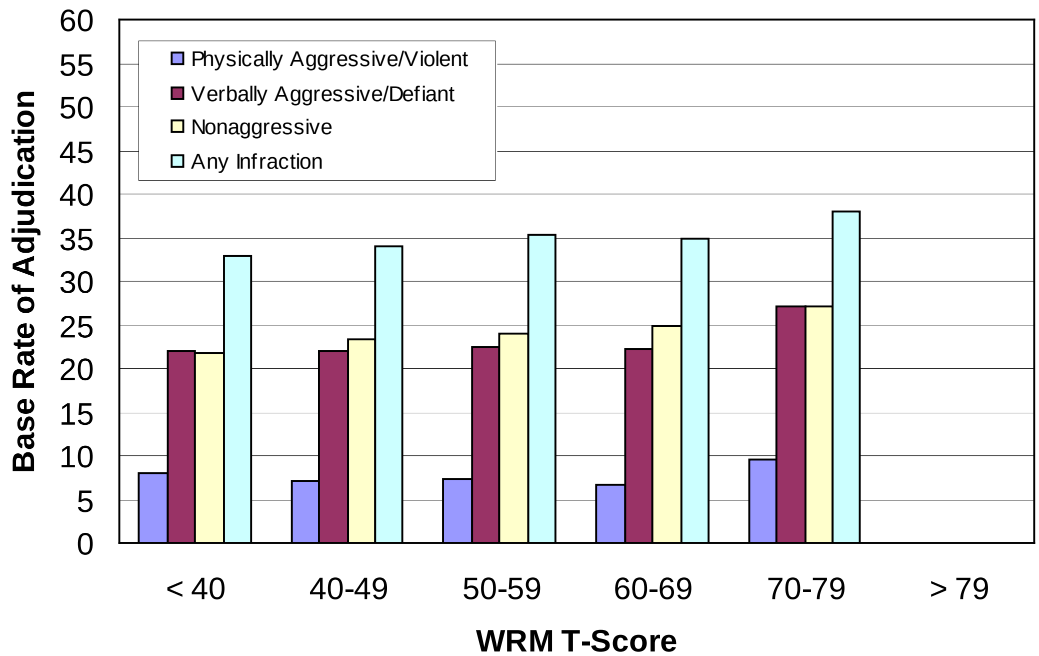

60
55
50
45
40
35
30
25
20
15
10
5
0
Base Rate of Adjudication
Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
< 40
40-49
50-59
60-69
70-79
> 79
NON T-Score



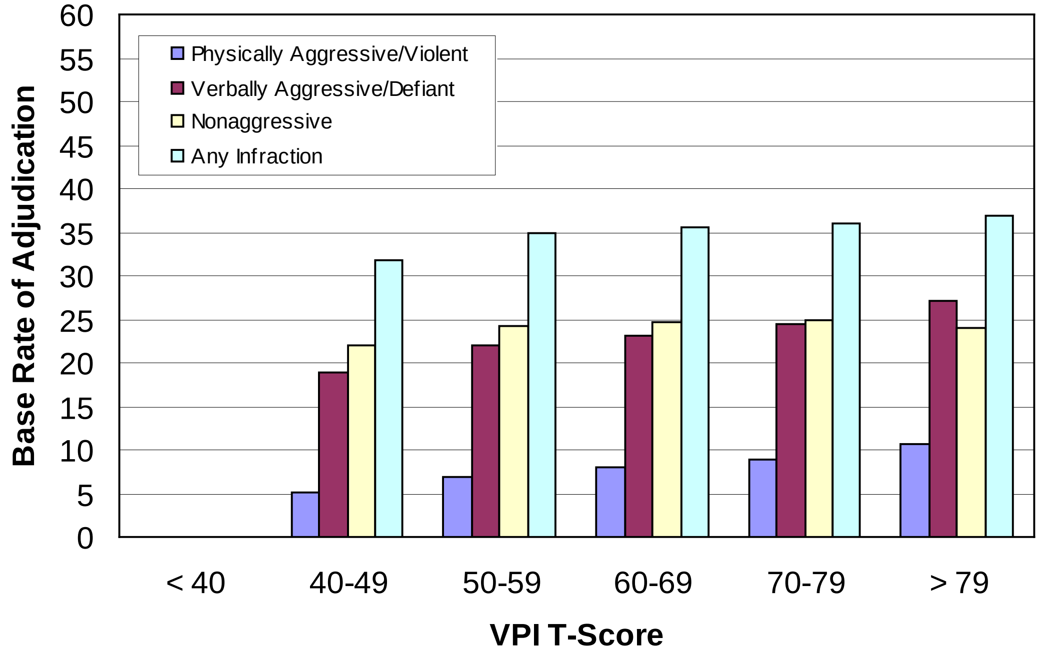
60
55
50
45
40
35
30
25
20
15
10
5
0
Base Rate of Adjudication
Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
< 40
40-49
50-59
60-69
70-79
> 79
RXR T-Score

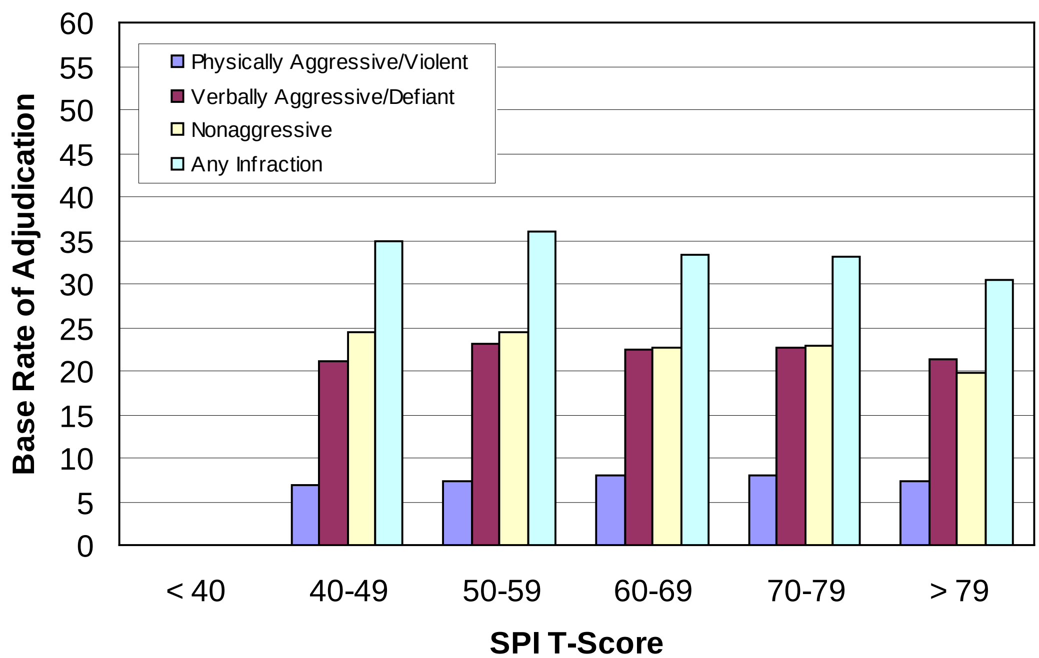
PAI Interpersonal Scales (N = 14,671)





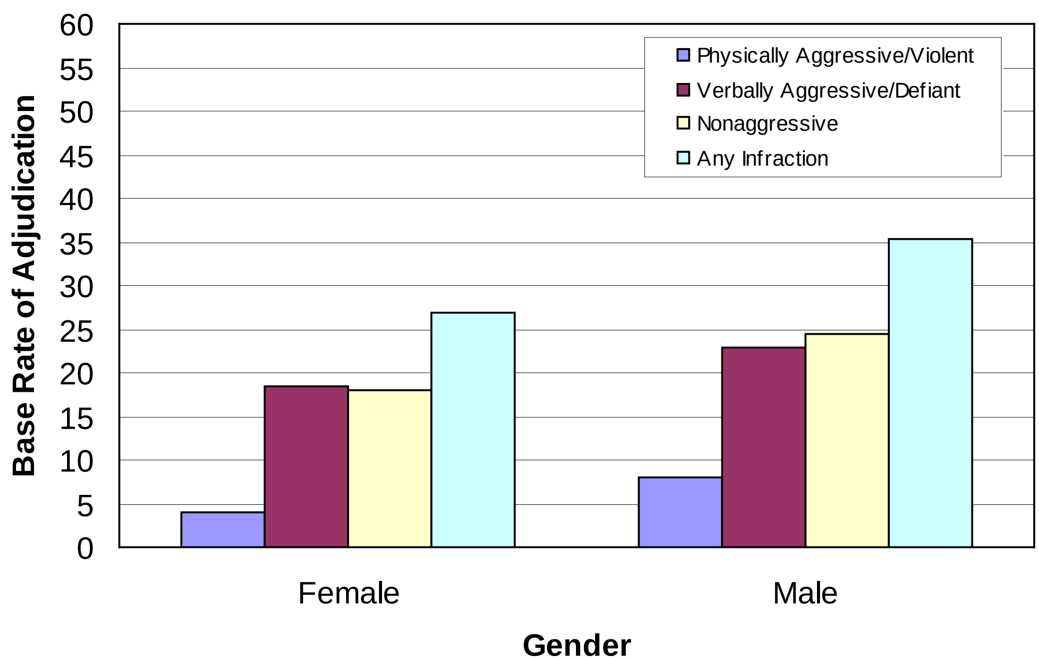
PAI Violence Potential and Suicide Potential Scales (*N* = 14,671)

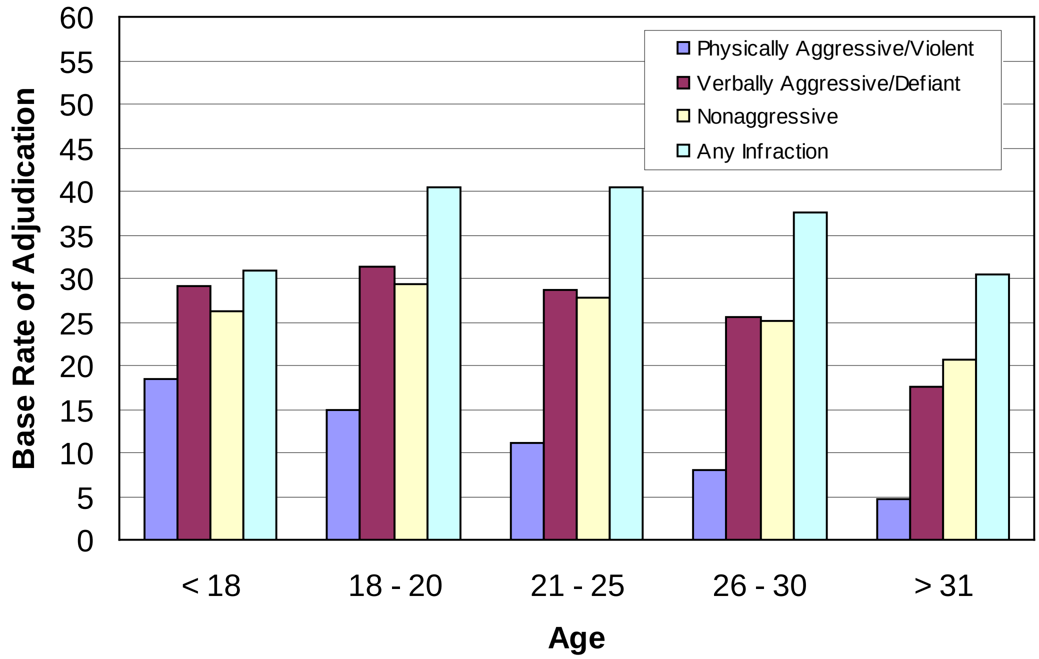


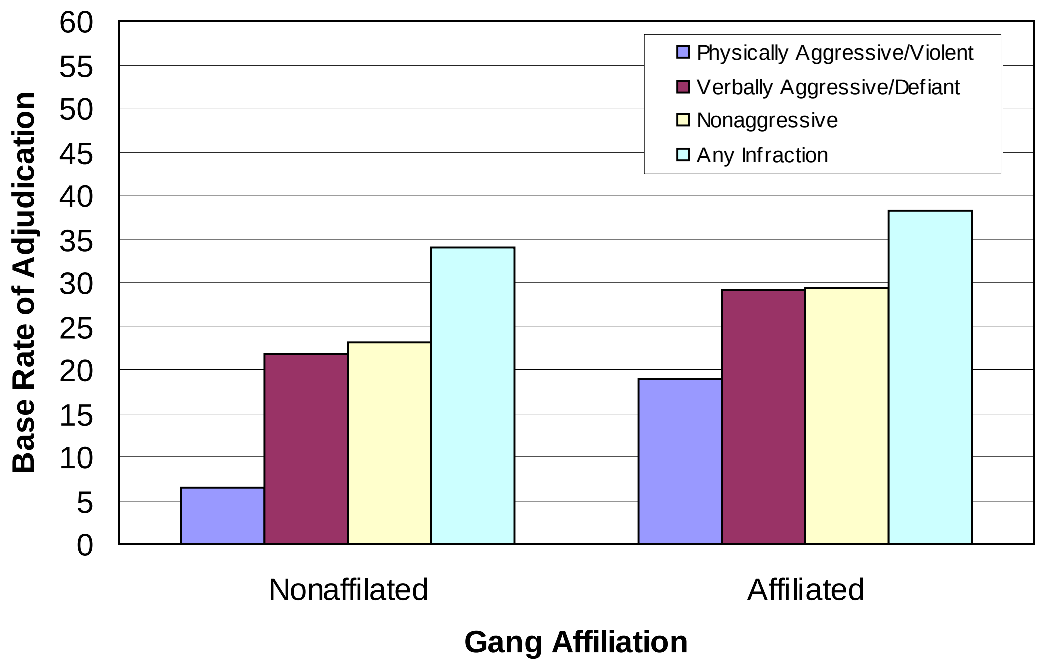


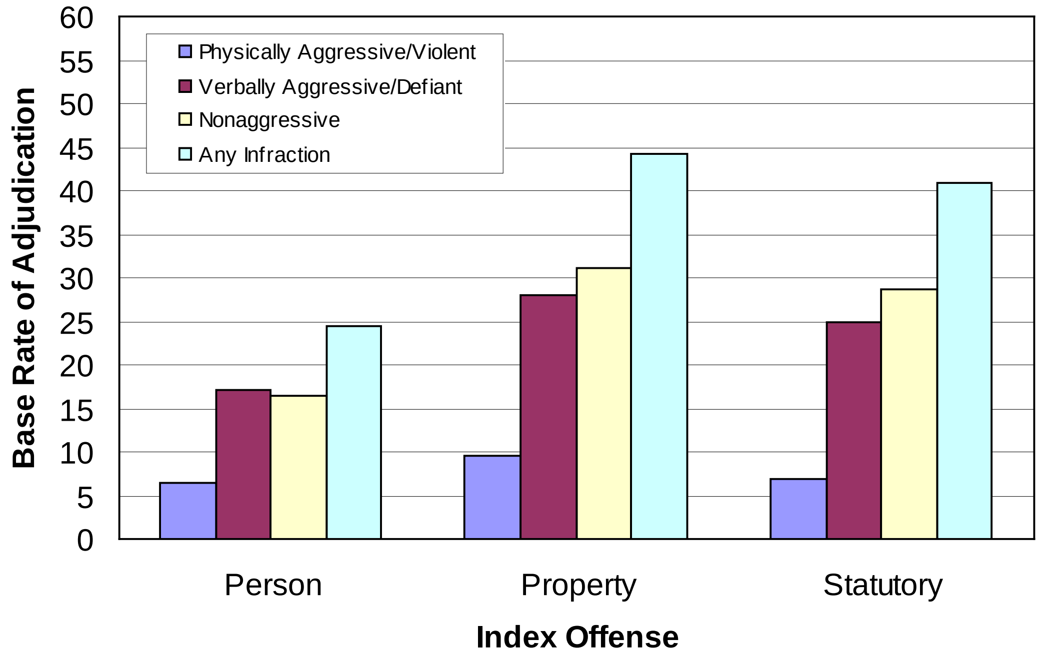
APPENDIX C

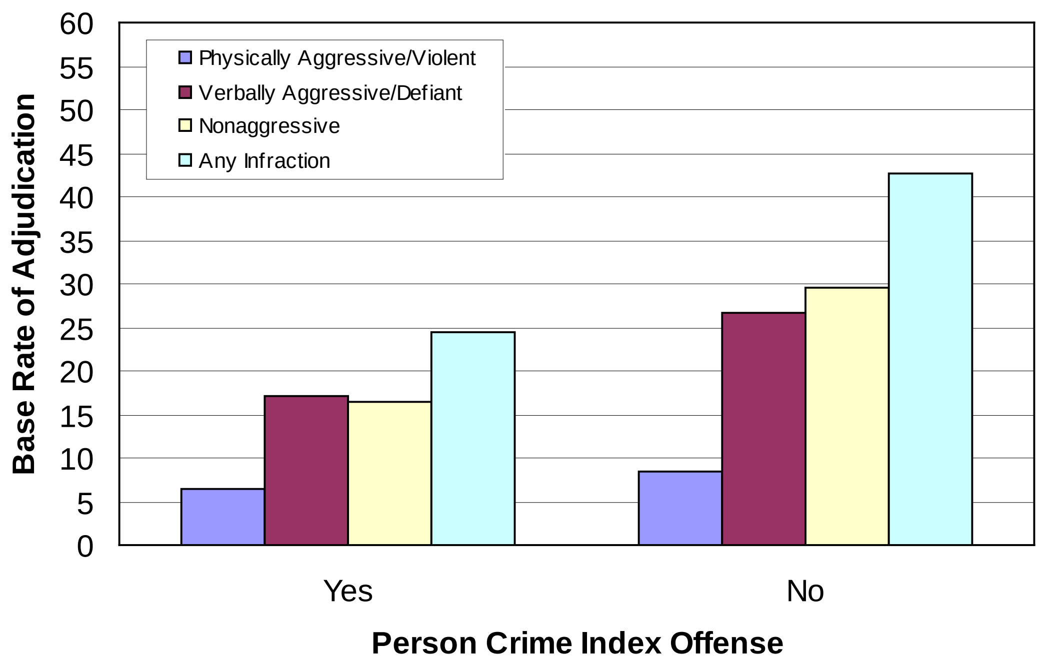
Base Rates of Adjudication According to Historical/Demographic Variables

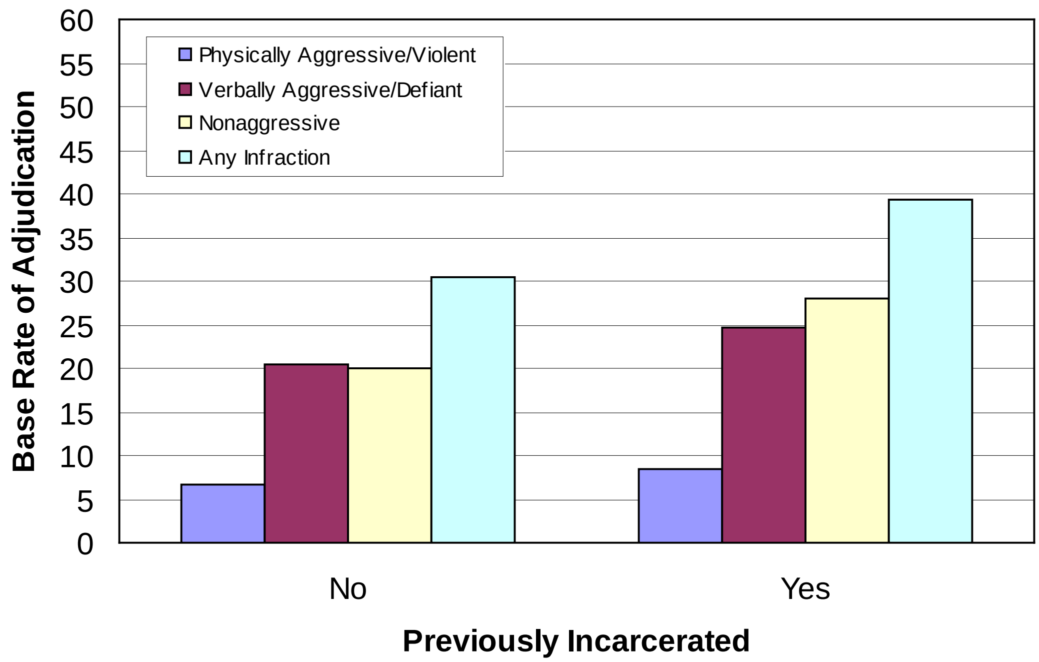



Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
Base Rate of Adjudication
60
55
50
45
40
35
30
25
20
15
10
5
0
< 18
18 - 20
21 - 25
26 - 30
> 31
Age


Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
Base Rate of Adjudication
60
55
50
45
40
35
30
25
20
15
10
5
0
Nonaffilated
Affiliated
Gang Affiliation


Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
Base Rate of Adjudication
Person
Property
Statutory
Index Offense


Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
Base Rate of Adjudication
Yes
No
Person Crime Index Offense


Physically Aggressive/Violent
Verbally Aggressive/Defiant
Nonaggressive
Any Infraction
Base Rate of Adjudication
60
55
50
45
40
35
30
25
20
15
10
5
0
No
Yes
Previously Incarcerated