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One Year Longitudinal Study of the Psychological Effects of Administrative Segregation

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ABSTRACT

One of the most widely debated topics in the field of corrections – the use of long-term administrative segregation (AS) – has suffered from a lack of empirical research. Critics have argued that the conditions of AS confinement exacerbate symptoms of mental illness and create mental illness where none previously existed. Empirical research has had little to offer this debate; the scant empirical research conducted to date suffers from research bias and serious methodological flaws. This study seeks to advance the literature in this regard.

This study tested three hypotheses: (1) offenders in AS would develop an array of psychological symptoms consistent with the security housing unit (SHU) syndrome, (2) offenders with and without mental illness would deteriorate over time in AS, but at a rate more rapid and extreme for the mentally ill, and (3) inmates in AS would experience greater psychological deterioration over time than the comparison groups.

Study participants included male inmates who were placed in AS and comparison inmates in the general population (GP). Placement into AS or GP conditions occurred as a function of routine prison operations. GP comparison participants included those at risk of AS placement due to their institutional behavior. Inmates in both of these study conditions (AS, GP) were divided into two groups – inmates with mental illness (MI) and with no mental illness (NMI). A third comparison group of inmates with severe mental health problems placed in San Carlos Correctional Facility, a psychiatric care prison facility, was also included. A total of 302 inmates were approached to participate in the study, and 55 refused to participate or later withdrew their consent. Participants were tested at 3-month intervals over a yearlong period.

Standardized test data were collected through self-report, correctional staff and clinical staff measures. Tests with demonstrated reliability and validity were selected to assess the eight primary constructs of interest: (1) anxiety, (2) cognitive impairment, (3) depression-hopelessness, (4) hostility-anger control, (5) hypersensitivity, (6) psychosis, (7) somatization, and (8) withdrawal-alienation. Extensive analyses of psychometric properties revealed that inmates self-reported psychological and cognitive symptoms in remarkably reliable and valid ways.

The results of this study were largely inconsistent with our hypotheses and the bulk of literature that indicates AS is extremely detrimental to inmates with and without mental illness. Similar to other research, our study found that segregated offenders were elevated on multiple psychological and cognitive measures when compared to normative adult samples. However, elevations were present among the comparison groups too, suggesting that high degrees of psychological disturbances are not unique to the AS environment. In examining change over time patterns, there was initial improvement in psychological well-being across all study groups, with the bulk of the improvements occurring between the first and second testing periods, followed by relative stability for the remainder of the study. Patterns indicated that the MI groups tended to be similar to one another but were significantly elevated compared to the NMI groups, regardless of their setting. Contrary to our hypothesis, offenders with mental illness did not deteriorate over time in AS at a rate more rapid and more extreme than for those without mental illness. Finally, although AS inmates in this study were found to possess traits believed to be associated with long-term segregation, these features cannot be attributed to AS confinement because they were present at the time of placement and also occurred in the comparison study groups. Implications for policy and future research are discussed.

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EXECUTIVE SUMMARY

INTRODUCTION

One of the most widely debated topics in the field of corrections – the use of long-term administrative segregation (AS) – has suffered from a lack of empirical research. The placement of offenders in AS environments, particularly those with serious mental illness, has been a point of contention. Critics have argued that the conditions of AS confinement exacerbate symptoms of mental illness and create mental illness where none previously existed. The use of AS across the country has persisted as a corrections management tool despite litigation, although in many states, the placement of mentally ill into AS is no longer permitted. Empirical research has had little to offer this debate; the scant empirical research conducted to date suffers from research bias and serious methodological flaws.

Now decades after the deinstitutionalization of states' mental health hospitals, corrections agencies have seen a surge of offenders with serious mental illness in their prisons. The rate of serious mental illness in the community is 6% (National Institute of Mental Health, 2010). Among the incarcerated, the rate of serious mental illness is tripled at about 18% (Ditton, 1999; O'Keefe & Schnell, 2008). A similar phenomenon is occurring within prisons, whereby a disproportionate rate of mentally ill are found within AS, estimated to be 50% higher than the rate within the general prison population (O'Keefe, 2008a). It is not known the extent to which this difference is caused by the AS environment. Researchers have been unable to settle the question of whether these high rates of mental illness are caused by AS relative to the general prison population or whether there is a selection bias such that offenders with mental illness, unable to adapt to general prison settings, are placed in AS at higher rates. This study seeks to advance the literature in this regard.

PURPOSE OF PRESENT STUDY

The broad purpose of the project was to evaluate the psychological effects of long-term segregation on offenders, particularly those with mental illness. This study examined conditions as they existed in the Colorado prison system with respect to AS, using the Colorado State Penitentiary (CSP) as the AS study facility. Only males were included because females represent 2% of Colorado's AS population. We did not assign inmates to segregation, but studied those conditions as they naturally occurred. The following are the primary goals and hypotheses.

Goal 1: To determine which, if any, psychological domains are affected, and in which direction, by the different prison environments. A multitude of psychological dimensions were examined, drawing from those most often cited in the literature. The broad constructs of interest were depression/hopelessness, anxiety, psychosis, withdrawal and alienation, hostility and anger control, somatization, hypersensitivity, and cognitive impairment. We hypothesized that offenders in segregation would develop an array of psychological symptoms consistent with the security housing unit (SHU) syndrome, with elevations across the eight constructs.

Goal 2: To assess whether offenders with mental illness decompensate differentially from those without mental illness. We were particularly interested in whether long-term segregation had a differential impact based on the presence of mental illness in offenders. We sought answers to the following questions: Does AS exacerbate symptoms in offenders with mental illness? Does AS create symptoms of mental illness in those who did not exhibit any at placement? It was hypothesized that offenders with and without mental illness would deteriorate over time, but the rate at which it occurred would be more rapid and more extreme for the mentally ill.

Goal 3: To compare the impact of long-term segregation against the general prison setting and a psychiatric care prison. In this study, the psychological and behavioral symptoms of offenders in AS were compared to similar offenders who were sent to San Carlos Correctional Facility (SCCF) or returned to the general prison population pursuant an AS hearing. This study used a repeated measures design over the course of a year to explore whether psychological distress was attributable to the various prison environments. It was hypothesized that inmates in segregation would experience greater psychological deterioration over time than the comparison groups.

This study also included an examination of individual characteristics such as mental health status, personality, and trauma history to determine if certain factors could predict patterns of change. Prediction analyses were exploratory in nature and we did not formulate a hypothesis about the variables that might predict differential rates of psychological decompensation.

METHOD

Group Assignment

Study participants included male inmates who were placed in AS and comparison inmates in the general population (GP). Placement into AS or GP conditions occurred as a function of routine prison operations, pending the outcome of their AS hearing, without involvement of the researchers. All study participants classified to AS were waitlisted for and placed in CSP. Inmates who returned to GP following an AS hearing were assumed to be as similar as possible to AS inmates and, therefore, comprised the comparison groups. Comparison participants also included inmates targeted for a diversionary program that identified inmates at high risk of AS placement due to their disruptive behavior. This program discontinued shortly after the study commenced, hence few participants were identified through this method. Inmates in both of these study conditions (AS, GP) were divided into two groups – inmates with mental illness (MI) and with no mental illness (NMI). There are fewer inmates with mental illness than without, but because both subgroups were of equal interest to this study, separate groups enabled over-selection of inmates with mental illness.

A third comparison group was included. This group included inmates with severe mental health problems placed in SCCF. Of the inmates placed in SCCF, only those with patterns of prison misbehavior, as measured by disciplinary violations, were included in the study. The purpose of the SCCF comparison group was to study inmates with serious mental illness and behavioral problems who were managed in a psychiatric prison setting.

Participants

A total of 302 male inmates were approached to participate in the study. Thirty refused to participate. Two more offenders were considered a passive refusal and were removed for inappropriate sexual behavior towards the researcher during the first testing session. An additional 23 offenders later withdrew their consent, although the data collected to the point of their withdrawal was used. In addition to refusals and withdrawals, 10 inmates released prior to the end of the study due to discretionary releases by the Parole Board and one participant death.

Five testing sessions were initially established at 3-month intervals, beginning with the date of consent and initial administration. Therefore, tests were scheduled at 3 months, 6 months, 9 months and 12 months after the baseline assessment. However, this schedule was problematic for the AS groups. When the study

began, there was a 3-month average wait for inmates to be transferred to CSP due to a shortage of AS beds. While on the waitlist, AS inmates were held in a punitive segregation bed at their originating facility. It was determined that the primary goal was to study inmates in a single long-term segregation facility (CSP) to limit confounding variables and that therefore the baseline measure should be collected upon placement into CSP. However, it was also recognized that significant changes could occur while inmates were held in segregation at their originating facility. Therefore, a “pre-baseline” measure was collected as close to the AS hearing as possible, which meant that the CSP groups completed six test intervals rather than five. The time between the pre-baseline and baseline measure varied according to how long the inmate was on the waitlist. The median time between pre and baseline tests was 99 days, although eight offenders were moved into CSP so quickly that they did not have a pre-baseline measure. In the analyses, tests were aligned across groups according to the test number, such that the CSP groups had an additional test at the end rather than at the beginning.

Participants’ ages ranged from 17 to 59 at the time of consent, with a mean age of 31.8 ($SD = 9.1$). The racial/ethnic breakdown of participants was 40% white, 36% Hispanic, 19% African American, 4% Native American, and 1% Asian. Of the inmates with mental illness who were included in this study, 56% were identified with a serious and pervasive disorder.

Materials

Assessment tools were selected to comprehensively cover the variety of psychological constructs associated with AS (e.g., Arrigo & Bullock, 2008; Grassian, 1983; Haney, 2003). The primary constructs assessed in this study were as follows: (1) anxiety, (2) cognitive impairment, (3) depression/hopelessness, (4) hostility/anger control, (5) hypersensitivity, (6) psychosis, (7) somatization, and (8) withdrawal/alienation. Additionally, malingering, self-harm, trauma, and personality disorders were assessed.

Research materials were selected to meet the following criteria: (1) use of assessments with demonstrated reliability and validity, (2) use of multiple sources for providing information (e.g., self-report, clinician ratings, files), (3) use of multiple assessments of each construct of interest, (4) ability to use within the prison setting, and (5) ease of administration, including no specialized equipment, no physical contact, length of time, and appropriate reading level.

The 12 self-report instruments used in this study were: (1) Beck Hopelessness Scale, (2) Brief Symptom Inventory, (3) Coolidge Correctional Inventory, (4) Deliberate Self-Harm Inventory, (5) Personality Assessment Screener, (6) Prison Symptom Inventory, (7) Profile of Mood States, (8) Saint Louis University Mental Status, (9) State-Trait Anxiety Inventory, (10) Structured Inventory of Malingered Symptomatology, (11) Trail Making Test, and (12) Trauma Symptom Inventory.

In addition to self-report assessments, ratings of psychological functioning were obtained from clinical staff and ratings of behavior in the housing unit were obtained from correctional staff. The Brief Psychiatric Rating Scale (BPRS) was completed by clinical staff and the Prison Behavior Rating Scale (PBRs) was completed by correctional staff.

Most assessments were collected at each testing period, although personality disorders, self-harm, and trauma history were not. It was determined that personality and trauma history were relatively stable constructs that needed to be assessed only once to limit the testing burden on study participants. Also, due to

the burden on already limited mental health resources, the BPRS was only administered at the first, third, and fifth testing intervals.

Data from official records were collected primarily from the Department of Corrections Information System, which is an administrative database of offender data. Offender characteristics to include demographic history, criminal history and offense data, institutional behavior, and needs levels were electronically downloaded.

Certain data elements were collected only for study participants during the course of their participation in the study. The following were collected and coded for the period of time between each testing interval for each participant: the amount of time spent in various settings (e.g., segregation, GP, hospital), phone records, and mental health crisis data. Additionally, activity logs from paper files for the CSP participants were collected and coded.

Procedure

Study enrollment began July 2007 and ended March 2009, with final testing of all participants completed in March 2010. The project operated under the approval of the institutional review board at the University of Colorado at Colorado Springs.

The research team was notified of AS hearings by the case management supervisor at each facility and of SCCF placements by the clinician who scheduled the facility transfers. Notification typically occurred before the hearings or SCCF placement to give the field researcher maximal lead time. Researchers reviewed electronic records to screen inmates for study eligibility.

The field researcher was a female university employee who completed the full training academy and had a badge that permitted her unescorted access to the facilities. In advance of each visit, the researcher contacted prison security to arrange visits with specific inmates. All inmates were escorted by security staff to the visiting room, which contained a noncontact booth for inmates in AS or punitive segregation conditions. The researcher met individually with each inmate to review the consent form, which included the general purpose of the study, voluntary nature of participation, risks and benefits, and remuneration. Inmates were advised that the purpose of the study was to learn about adjustment to prison and offenders in prisons across the state were participating in this study.

At the time of consent, the initial test battery was administered. The field researcher instructed participants to read the directions for each test. Instructions were highlighted by researchers when there was an indication on the test to respond with respect to a certain timeframe (e.g., in the past week). The researcher administered the timed tests, and she assisted if they had questions, most frequently with the definition of a word. The researcher collected the test packet immediately following its completion, so it was not ever handled by security staff.

The field researcher distributed the PBRs to housing staff at each testing interval and collected the completed forms upon return visits to the facility. Mental health clinicians were generally notified that a BPRS was needed a couple weeks prior to the researcher testing to give them time to complete the assessment.

Participants' data were kept in two separate databases. The eligibility database tracked the eligible pool of offenders, such as identifying information, current location, date of AS hearing or SCCF placement, expected

release date, mental health status and clinician approval, selection into study or reason for exclusion, and date of consent or refusal. A testing schedule for study participants was incorporated into the database, which also had reporting capabilities in order to manage the project. A separate database tracked participants' responses to the standardized tests; no identifying information was included in this database other than a secure researcher-assigned identification number. Both databases were stored on a secured server with access restricted to project researchers.

FINDINGS

The results of this study were largely inconsistent with our hypotheses and the bulk of literature that indicates AS is extremely detrimental to inmates with and without mental illness. We hypothesized that inmates in segregation would experience greater psychological deterioration over time than comparison inmates, who were comprised of similar offenders confined in non-segregation prisons. Consistent with other research, our study found that segregated offenders were elevated on multiple psychological and cognitive measures when compared to normative adult samples (Haney, 2003; Suedfeld, Ramirez, Deaton, & Baker-Brown, 1982). However, there were elevations among the comparison groups too, suggesting that high degrees of psychological disturbances are not unique to the AS environment. The GP NMI group was the only one that was similar to the normative group on a number of scales.

In examining change over time patterns, there was initial improvement in psychological well-being across all study groups, with the bulk of the improvements occurring between the first and second testing periods, followed by relative stability for the remainder of the study. On only one measure – withdrawal – did offenders worsen over time, but this finding was only true for the two NMI groups, so it is not attributable to AS. Even given the improvements that occurred within the study timeframe, the elevations in psychological and cognitive functioning that were evident at the start of the study remained present at the end of the study.

Another hypothesis was that offenders with mental illness would deteriorate over time in AS at a rate more rapid and more extreme than for those without mental illness. Patterns indicated that the MI groups (CSP MI, GP MI, SCCF) tended to look similar to one another but were significantly elevated compared to the NMI groups (CSP NMI, GP NMI), regardless of their setting. For the AS offenders, the MI group scored worse than the NMI group on all self-report measures except the Trails test and all staff measures except the PBRs Anti-Authority scale. In addition to the changes over time described above, PBRs scores decreased significantly for segregated inmates regardless of their mental health status, which would be an indicator that staff may be perceiving improvements, but the significant differences were from the first to the second assessment periods when the majority of participants changed facilities, which suggests this is perhaps a measurement error rather than a true improvement. As hypothesized there was a differential time effect for the MI and NMI groups on several composite measures (i.e., anxiety, hostility-anger control, hypersensitivity, somatization), but the interactions were in the opposite direction of our hypothesis; on average, the CSP NMI group did not change while the CSP MI group improved.

We stated that offenders in segregation would develop an array of psychological symptoms consistent with the SHU syndrome. As already discussed, all of the study groups, with the exception of the GP NMI group, showed symptoms that were associated with the SHU syndrome. These elevations were present from the start and were more serious for the mentally ill than non-mentally ill. In classifying people as improving, de-

clining, or staying the same over time, the majority remained the same. There was a small percentage (7%) who worsened and a larger proportion (20%) who improved. Therefore, this study cannot attribute the presence of SHU symptoms to confinement in AS. The features of the SHU syndrome appear to describe the most disturbed offenders in prison, regardless of where they are housed. In fact, the group of offenders who were placed in a psychiatric care facility (SCCF) had the greatest degree of psychological disturbances and the greatest amount of negative change.

Finally, in this study, we conducted some exploratory predictive analyses to determine if there were individual characteristics that could identify who may be at greater risk of psychological harm from segregation. There were no individual predictors that showed strong effects for predicting change. This could indicate that we did not have the correct predictors or that patterns of decompensation are individualized (i.e., not predictable), but it is more likely that the relative stability over time makes it difficult to predict change.

A review of the findings warrants a discussion of plausible alternative explanations that might account for our results. The use of a repeated measures design enabled us to determine that change was occurring and in which direction. Even given the debate about whether or not harmful effects resulted from AS, it was never suggested that inmates might improve as this study found. The presence of comparison groups avoids an attribution error; the changes, improvements in this case (i.e., 20%), are not due to segregation. These conclusions replicate those drawn by Zinger and colleagues (2001) where there was a similar lack of evidence of harm. These studies suffered criticism for high refusal rates, high attrition rates, small sample sizes, and short durations – limitations that were corrected in the present study (note, however, that no generalizations should be made beyond the 1 year follow-up period in this study). Furthermore, the use of reliable and valid standardized measures enabled the present research study to assess psychological functioning in an objective manner. Although the majority of these tests were not normed for prisoner populations, the current reliability and validity findings increased our confidence in these measures.

POLICY IMPLICATIONS

Does this study legitimize the use of segregation with offenders, including those with serious and persistent mental illness? Because this study may not generalize to other prison systems, especially those that have conditions of confinement dissimilar to CSP, it is not possible to conclude that AS is not detrimental for all offenders. Systems that are more restrictive and have fewer treatment and programming resources should not generalize these findings to their prisons. Replication is needed to understand how increased services, privileges, and out of cell time ameliorate the unintended consequences of AS, and research needs to inform prison systems about the standards and practices necessary to protect inmates in segregation from harmful psychological effects.

It is also important to note that there may be other negative consequences of AS that we did not study. For example, Lovell, Johnson, and Cain (2007) found that inmates released directly from segregation to the streets had dramatically higher rates and severity of detected recidivism than AS inmates who first released to GP (but see Mears & Bales, 2009). We also did not study the degree to which AS met its purported goal of changing inmate behavior for the better over time. The only questions addressed by this study were related to psychological changes over time in segregation. Thus, we make no empirical or value judgments about whether and to what degree the use of AS balances the benefits (e.g., a safer prison system) with costs (e.g., significant reductions in freedom).

It is impossible to ignore the extremely disproportionate rate at which inmates with serious mental illness are assigned to AS (Lovell, 2008; Metzner & Fellner, 2010; O'Keefe, 2008a), which has to some degree "shocked the conscience" of the courts (see *Jones 'El v. Berge*, 2001; *Madrid v. Gomez*, 1995; *Ruiz v. Johnson*, 1999). In an era when prisons are expected to implement evidence-based practices and to rehabilitate offenders who will be releasing back to the community, is it enough to avoid harm? Must we ask ourselves another question: what are the conditions required to *improve* inmates' mental well-being while in segregation? Prison systems are held to a standard of treatment that is at least equivalent to community standards. It is likely that this most difficult segment of society has failed at all levels of community treatment and earlier criminal justice interventions, but the quest to treat and improve services for the most needy is an important reality facing corrections agencies.

Regarding their psychological functioning and levels of distress, these data suggest, although the differences were small, that inmates with serious mental illness are less likely to improve in segregation *and* are less likely to get worse compared to mentally ill inmates in GP. We do not assume that the reasons for these apparently contradictory findings are the same. For example, it is possible that fewer inmates with mental illness get worse because segregation is a safer and more structured environment. On the other hand, hypotheses regarding their unlikeliness to improve include the significant limitations that segregation places on various types of therapeutic activities and services such as group therapy. Further, the data do not tell us which aspects of AS prevent psychological improvement and deterioration, respectively, among inmates with mental illness. However, since prisons have a constitutional duty to respond to serious medical (including psychiatric) needs, the possibility that segregation may prevent improvement is cause for concern and further study.

There remain significant implications for mental health staff who work in prison systems that permit the placement of mentally ill in long-term segregation. It is critical for mental health staff to screen and assess offenders prior to AS placement to determine their vulnerability to harm that might occur as a result of their segregation. While in segregation, it is important that the mental status of all offenders be assessed on a frequent, regular basis through rounds and individual sessions. Prison systems need to have a range of confinement options, such that offenders who are at risk of or are showing signs of decompensation can be removed from segregation and placed in an alternative high security environment that permits greater out of cell time and interaction with others.

Other systems have rejected confinement models that isolated offenders and held them in extremely restrictive spaces. Even if the segregation models of the early 1900's and the state psychiatric hospitals of the mid-19th century are viewed as "primitive" compared to modern-day AS facilities, it is important to examine and understand why these models failed and were ultimately dismantled. Although there are a number of researchers who predict that there is no end in sight to the supermax model (King, 1999; Mears, 2008; Pizarro & Narag, 2008; Pizarro & Stenius, 2004), they have also raised empirical questions regarding their efficacy. Questions about the efficacy of AS will be asked until more is known about whether the use of AS in prison systems improves conditions for the rest of the system, whether and how they improve inmate behavior within and beyond the prison walls, whether they are cost-effective, whether they increase risks to public safety, and whether there are settings or individuals that are prone to psychological deterioration.

INTRODUCTION

One of the most widely debated topics in the field of corrections – the use of long-term administrative segregation (AS) – has suffered from a lack of empirical research. The placement of offenders in AS environments, particularly those with serious mental illness, has been a point of contention. Critics have argued that the conditions of AS confinement exacerbate symptoms of mental illness and create mental illness where none previously existed. The use of AS across the country has persisted as a corrections management tool despite litigation, although in many states, the placement of mentally ill into AS is no longer permitted. Empirical research has had little to offer this debate; the scant empirical research conducted to date suffers from research bias and serious methodological flaws.

Now decades after the deinstitutionalization of states' mental health hospitals, corrections agencies have seen a surge of offenders with serious mental illness in their prisons. The rate of serious mental illness in the community is 6% (National Institute of Mental Health, 2010). Among the incarcerated, the rate of serious mental illness is tripled at about 18% (Ditton, 1999; O'Keefe & Schnell, 2008). A similar phenomenon is occurring within prisons, whereby a disproportionate rate of mentally ill are found within AS, estimated to be 50% higher than the rate within the general prison population (O'Keefe, 2008a). It is not known the extent to which this difference is caused by the AS environment. Researchers have been unable to settle the question of whether these high rates of mental illness are caused by AS relative to the general prison population or whether there is a selection bias such that offenders with mental illness, unable to adapt to general prison settings, are placed in AS at higher rates. This study seeks to advance the literature in this regard.

CHARACTERISTICS OF LONG-TERM SEGREGATION

“Supermax” is the popular term used to describe the technologically advanced, supermaximum security prisons designed for single-cell occupancy that were rapidly being constructed across the nation during the 1990's. Even when new construction was not possible, existing prisons were retrofitted to conform to this new model. Therefore, a supermax *facility* may refer to an entire facility or a distinct unit within a facility (National Institute of Corrections, 1997). Although there was a virtual explosion of supermax facilities over the past two decades, similar units have operated on a smaller scale for decades (Zinger, Wichman, & Andrews, 2001).

The modern-day supermax model is traced back to the U.S. Penitentiary in Marion, Illinois, that went into permanent lockdown status in 1983. Prior to Marion, the Federal Bureau of Prisons operated solitary confinement at the Alcatraz Island Prison until it closed in 1963. History points to even earlier uses of solitary confinement including Pennsylvania's Eastern State Penitentiary, which opened in 1829 and was later modeled in European prisons (Smith, 2008). However, these early models featured such extreme social isolation and sensory deprivation (Cohen, 2008) and were so primitive that there is little comparison between them and today's modern supermaxes (National Institute of Corrections, 1999).

Across prison systems, different terms are used to describe the same concept: administrative segregation or AS, control units, security housing units or SHUs, and security controls unit (Haney, 2003; NIC, 1999). In Colorado, it is known as AS. Just as the names vary, so do the conditions. However, the defining feature that is frequently associated with this model is single-cell confinement for 23 hr per day, with 1 hr allowed out of cell for showers and exercise. AS is differentiated from *punitive* or *disciplinary segregation*, which is a time-

limited punishment enforced for a prison violation pursuant a full due process hearing; placement in AS is an administrative decision that often extends for an indefinite time period.

AS prisons are costly to build and operate due to costs associated with high security that include single-occupancy cells, high staff to inmate ratios, and technology (Mears & Bales, 2009). Because inmate movement requires multiple restraints and staff, many services are provided at the cell door, including meals, library, mental health services, and programs. Newer AS facilities are equipped with advanced technological equipment, which enables delivery of even more services to inmates in their cells (e.g., visitation through videoconferencing) or within the facility (e.g., medical and dental procedures). Although technological equipment is designed and used to reduce security breaches, it also increases the degree of isolation experienced by inmates.

It is difficult to establish the number of inmates held in AS nationally. In 1999, King estimated that 1.8% of all state prisoners were housed in AS. Although prevalence estimates are higher now than in 1999, prison systems under-report the actual use of AS, likely due to the negative connotation associated with the supermax label used in national reporting (Naday, Freilich, & Mellow, 2008). For example, the Federal Bureau of Prisons reported no inmates in AS, protective custody, or supermax beds in 2008 (American Correctional Association, 2009), which is inaccurate. Additionally, states reported drastically different numbers of offenders in AS from year to year (see Naday et al., 2008). Given these limitations, it is estimated that at least 3.2% of all state prisoners in 2008 were housed in AS or protective custody (American Correctional Association, 2009), although this appears to be an under-estimation of the true prevalence rates.

CRITICISMS OF THE AS MODEL

The use of AS has sparked a controversy resulting in considerable criticism of the prison system and its administrators. The limited number of research studies and the inadequacies of existing research on AS have only fueled the controversy. Numerous researchers and forensic professionals have called for more research to examine whether evidence based practices are in place and to examine whether harm is being done by confining inmates to segregation (Kurki & Morris, 2001; Lovell et al., 2007; Mears, 2008; Metzner & Dvoskin, 2006; Pizarro & Narag, 2008), but the topics and setting are difficult ones in which to conduct research (Mears & Watson, 2006; Naday et al., 2008).

One criticism has been the lack of evidence that segregation has achieved its intended goal of reducing violence in the prison system (Kurki & Morris, 2001; Mears, 2008). There is some literature to suggest that wardens and prison systems find this model to be effective in reducing violence and increasing order within the larger prison system (Atherton, 2001; Mears & Watson, 2006; Ward & Werlich, 2003). However, these studies lack the appropriate statistical controls to assert that the improvements are measurable and attributable to AS rather than merely perceptions of wardens or the result of other management controls also put into place at the same time. In an empirical study of institutional violence in three states, Briggs, Sundt, and Castellano (2003) did not find that AS reduced inmate-on-inmate violence. However, in a follow-up study, Sundt, Castellano and Briggs (2008) found that permanent reductions in inmate-on-staff violence were attributable to the opening of an AS prison in Illinois.

Corrections departments have been moving towards evidence-based models and practices to improve the rehabilitation opportunities for offenders. These practices include standardized assessments, matching offender needs to services, cognitive-behavioral programs, re-entry services, structured decision making

guidelines, and intensive treatment programs such as therapeutic communities. By endorsing an administrative action to determine placement of inmates into AS, corrections agencies have moved away from the evidence-based risk and classification instruments in favor of more subjective decisions. This criticism applies to both the decision to place inmates in AS and their continuation in AS (Human Rights Watch, 2000; O’Keefe, 2008b; Pizarro & Narag, 2008).

An emerging concern is the return of offenders from AS to society, which may occur with little or no step-down process such that offenders are released directly to the streets from 23/7 confinement. Although the adjustment required for offenders to adapt to rapid and extreme socialization changes is of concern, the issue of public safety is perhaps of even greater concern. Research has indicated that AS inmates have higher recidivism rates than non-AS offenders (Mears & Bales, 2009; Motiuk & Blanchette, 2001; O’Keefe, 2005), but this is likely due to the selection effects of who is confined to AS. When matching procedures were engaged, no differences in overall recidivism rates were found between AS and matched non-AS inmates (Lovell et al., 2007; Mears & Bales, 2009). Mears and Bales (2009) found a small, but significant difference when violent recidivism was the outcome measure rather than general recidivism; 24.2% of AS inmates had a violent re-offense compared to 20.5% of matched non-AS inmates. Lovell et al. (2007) found that inmates who released directly from AS had a higher recidivism rate than matched offenders who transitioned from AS to a lower security facility prior to release. In contrast, Mears and Bales (2009) found neither a recency effect (i.e., amount of time that elapsed between AS confinement and release) nor an exposure effect (i.e., total amount of time spent in AS confinement) on recidivism rates.

Human rights concerns are tantamount to a discussion of the criticisms of the AS model. The use of AS has been called a human rights violation, and some have even labeled it torture (Gawande, 2009; Metzner & Fellner, 2010). Many find the conditions of solitary confinement to be excessively harsh and inhumane (Cohen, 2008; Haney, 2003, 2008; Human Rights Watch, 1997, 1999, 2000; King, 1999; Kupers, 2008; Kurki & Morris, 2001; Toch, 2001). Specifically, the lack of treatment, programs, and activities to engage the mind; the restricted personal contact; lack of control over light and sound; lack of windows; and little or no access to the outdoors are considered to be more extreme than is required for the safe operation of prisons. Additionally, when people are held in highly restrictive environments where they have little control over their life, there is a greater opportunity for staff to inflict abuses upon those confined within (Haney, 2008; Human Rights Watch, 2000; Kurki & Morris, 2001).

The most significant issue is the question of whether prisoners are able to psychologically adapt to the conditions of AS. There is concern that mentally healthy individuals will decompensate in segregation, but recent discussions have centered on the placement of offenders with mental illness in such environments. Because the harmful effects of AS is the central focus of this study, we will examine the evidence as it is available both in case law and in the research literature.

CASE LAW REVIEW

As is the case with many important issues that affect the correctional system, conditions of AS confinement have been challenged in U.S. courts. In a pivotal First Amendment case heard in the Supreme Court, *Turner v. Safley* (1987) set a standard for lower courts to evaluate the claims of prisoners such that deference is given to prison administrators to set policies to ensure the safe operation of their prisons. Although the Court’s decision does not prevent inmates from making claims against AS confinement, it limits the scope of claims that they might successfully litigate to conditions that are needlessly harsh or unreasonable (Pizarro

& Narag, 2008). Additionally, the Prison Reform Litigation Act of 1996 was enacted to restrict the filing of prisoners' cases in federal court. Consequently, most of the case law surrounding AS has been on the grounds of a Fourteenth or Eighth Amendment violation (Collins, 2004).

Fourteenth Amendment

Under the Fourteenth Amendment of the U.S. Constitution, the state must adhere to certain procedures in deciding to deprive inmates of their liberty interest (Collins, 2004). In *Sandin v. Conner* (1995), it was determined that a liberty interest is created only when there is an "atypical and significant deprivation in relation to the normal incidents of prison life." In such cases, certain due process procedures are required.

Segregation that does not pose an atypical and significant hardship is not subject to due process, including such confinement that may occur during a period of investigation into inmates' misconduct (*Jones v. Baker*, 1998). However, in *Wilkinson v. Austin* (2005), it was decided that the plaintiffs' due process and liberty interest had been violated because the combination of conditions were significantly more restrictive than other Ohio state correctional facilities (e.g., isolation, lack of control over heating and lighting, no outside recreation) and because of the length of confinement. The court upheld the *Hewitt v. Helms* (1983) decision that these inmates were entitled to minimal procedural requirements, specifically timely notice of an AS evidentiary hearing, reason for confinement, and sufficient opportunity for response.

Extended confinement in segregation without a review hearing was also determined to be a violation of the Fourteenth Amendment. A New York court found that periodic review of inmates' continued need for such confinement is required (*McClary v. Kelly*, 1998).

Eighth Amendment

The Eighth Amendment ensures prisoners protection from cruel and unusual punishment. Because this concept is subjective, the Supreme Court has established the following standards:

- (a) shocks the conscience of the Court, (b) violates the evolving standards of decency of a civilized society, (c) punishment that is disproportionate to the offense, and (d) involves the wanton and unnecessary infliction of pain (Collins, 2004, p. 106).

In examining the conditions of confinement, the totality of circumstances must be weighed; although each individual condition might not be a violation, the combination of conditions might constitute one. Furthermore, prison officials must demonstrate "deliberate indifference" to a prisoner's basic human need in order for there to be an Eighth Amendment violation.

The use of prolonged segregation was tested in three significant cases in California (*Madrid v. Gomez*, 1995), Texas (*Ruiz v. Johnson*, 1999), and Wisconsin (*Jones 'El v. Berge*, 2001). Long-term segregation was not deemed a violation, except in the case of inmates with serious mental illness where extended stays were ruled unconstitutional. In *Madrid v. Gomez* (1995), not only was it ruled cruel and unusual punishment to place mentally ill inmates in the SHU, those at reasonably high risk of suffering mental illness as a result of SHU conditions were also restricted. Explicit in these cases is the requirement of correctional mental health staff to screen, assess, and monitor offenders for mental illness or emerging symptoms resulting from their placement in segregation.

It is also significant to note that in a number of states, settlement cases have also prevented or mitigated the placement of inmates with serious mental illness into long-term segregation. These states include Ohio,

Connecticut, Indiana, New Mexico, New York, and Mississippi. Other cases, in states such as New Jersey and Florida, have led to agreements to modify the terms under which prisoners with mental illness can be put or kept in segregation (Jamie Fellner, personal communication, June 10, 2010).

RESEARCH REVIEW

There exists a large body of peer-reviewed literature surrounding long-term segregation and solitary confinement. Many of these publications are literature reviews, theoretical articles, and case studies; few meet the American Psychological Association (2009) standard of empirical study article defined as reporting on original research or presenting new data analyses not addressed in previous reports, whether qualitative or quantitative. For example, in the 2008 special edition of *The Disturbed Offender in Confinement* published by Criminal Justice and Behavior, many of the nine articles focused on AS or other types of high security settings but only one (Lovell, 2008) presented an empirical study. Also in 2008, The Prison Journal released a special issue entitled *Supermax Prisons*. Only two of the eight articles (Sundt et al., 2008; O’Keefe, 2008b) meet the American Psychological Association standard for empirical research (2009). The large number of articles and corresponding lack of empirical research reinforce this as an important area of forensic psychiatry in which it is very difficult to conduct viable research.

The entire body of literature has been critical to advancing our understanding of AS confinement and its related issues. We relied on this literature to shape our hypotheses and research design in the present study. The case study research in particular has been useful to illustrate problems that might be attributed to AS (i.e., serious psychological harm) and highlight the need for research (see Benjamin & Lux, 1975; Human Rights Watch, 1997, 1999; King, 1999; Kurki & Morris, 2001; Rhodes, 2004). However, there are serious limitations with case studies. Small sample sizes, as are the norm in case studies, mean findings may not generalize to all, or even most, segregated offenders. Particularly concerning is that sampling procedures are often not discussed, suggesting that special care was not taken to select a representative sample. Additionally, these approaches do not provide a relative comparison of the participants’ behavior in other settings; inmates who report serious psychological difficulties in segregation may experience those same problems in other prison settings or in society. Because we are interested in conducting an empirical study, our review of the research focuses on other empirical studies of the psychological effects of AS along with several key articles that informed our selection of psychological measures.

The SHU Syndrome

In 1983, Dr. Grassian described the psychopathological features resulting from AS that he believed to form a clinical syndrome, which later became known as the SHU syndrome in the wake of *Madrid v. Gomez* (1995) case. He interviewed 14 plaintiffs in a conditions-of-confinement lawsuit and described his clinical observations resulting from those interviews. Grassian noted perceptual changes, affective disturbances, cognitive difficulties, disturbing thought content, and impulse control problems that immediately subsided following release from such confinement. In more recent research, Haney (2003) found elevated symptoms of psychological trauma (e.g., anxiety, headaches, impending nervous breakdown, lethargy) and psychopathological features (e.g., ruminations, social withdrawal, irrational anger) among 100 SHU prisoners as compared to national probability samples. This constellation of symptoms composes the primary features of what has been coined the SHU syndrome.

Quantitative Research

Well-designed quantitative studies, although often not as rich in detail as case studies or qualitative research, can provide information about the impact of segregation on psychological well-being through the use of randomly sampled participants, representative samples, comparison groups, objective data collection strategies, standardized procedures, and analytical strategies that account for random error. Research on the effects of AS have been criticized for lacking these quality components that allow one to rule out plausible alternative explanations (Arrigo & Bullock, 2008; Metzner & Dvoskin, 2006; Pizarro & Narag, 2008; Zinger et al., 2001).

A key component that distinguishes research from demonstrations is the use of control or comparison groups. Because of the lack of a comparison group, some frequently cited studies are actually demonstrations of the potential impacts of AS (e.g., Brodsky & Scogin, 1988; Haney, 1993; Grassian, 1983). In the simplest research design, a study will compare a “treated” group to a control or comparison group to determine if the groups are different on the variable of interest. In a pure experimental design where participants are randomly assigned to conditions (e.g., segregation, general prison population), differences between groups would indicate the impact of segregation on the outcome variable; however in applied studies where random assignment to conditions is not feasible, the differences between the segregation group and a comparison group may be due to segregation or to other uncontrolled factors. The quality of the comparison depends on the similarity between the control/comparison group and the experimental/treated group.

Several quantitative studies have used comparison groups to explore the impact of segregation on psychological outcomes. Several of these studies have been experimental in nature in that inmates who volunteer to be randomly assigned to either segregation or comparison conditions for a short period of time (e.g., Ecclestone, Gendreau, & Knox, 1974; Gendreau & Bonta, 1984; Gendreau, Freedman, Wilde, & Scott, 1968, 1972; Gendreau, McLean, Parsons, Drake, & Ecclestone, 1970). These studies tend to show little impact of segregation on mental well-being but can be criticized for lacking ecological validity by using participants who volunteered to be placed in segregation, using small samples sizes, and for being short-term, all of which do not match the current reality of how AS exists in U.S. prisons today. To demonstrate ecological validity, conditions under investigation should reflect real life conditions. Similarly, comparisons to prisoners of war or use of college students and inmate volunteers, lacks the ecological validity necessary to generalize the findings to inmates in segregation.

Cross-Sectional Designs

Non-experimental research, which may demonstrate more ecological validity, have used a variety of comparison groups including general, non-inmate populations and norms (e.g., Haney, 2003; Hodgins & Côté, 1991; Suedfeld et al., 1982), general population prisoners (e.g., Hodgins & Côté, 1991), and inmates in different security levels who report being in segregation or not ever experiencing segregation (Suedfeld et al., 1982). Most, although not all, of these studies concluded that inmates in AS demonstrate higher levels of psychological distress. Because the quality of the conclusions depends on the similarity between the comparison group and the AS group, these cross-sectional studies lack the ability to attribute these differences to the conditions of confinement. In these studies, it is not possible to rule out alternative explanations due to selection bias and potential pre-existing differences, including psychological differences that may have existed prior to entering AS (i.e., there has been an inability to establish the time precedence between AS

and psychological well-being). An improved design strategy is to select a comparison group that has been matched to the segregation group on important variables (e.g., Lovell et al., 2007; Mears & Bales, 2009).

Longitudinal Designs

In order to truly understand how AS impacts the well-being of inmates, an improvement over cross-sectional design strategies with a comparison group is to study how inmates change over time using a longitudinal (or repeated measures) design. Studying intra-individual change allows for better understanding on whether change occurs as well as explication of how change occurs. In longitudinal designs, individuals serve as their own control group, and comparisons from baseline allow one to see how change is occurring. Adding a comparison group in a longitudinal design will allow one to rule out additional alternative explanations when change is (or is not) occurring.

There have been few longitudinal studies about the effects of segregation. Early studies by Gendreau and colleagues (Ecclestone et al., 1974; Gendreau & Bonta, 1984; Gendreau et al., 1968, 1970, 1972) used repeated measures experimental designs over periods of up to 10 days to explore the effects of segregation on psychological and physiological measures. Few negative impacts of segregation were found over these brief time periods. Although use of a repeated measures experimental paradigm improves over cross-sectional studies which may have selection bias issues, the short confinement periods are unrealistic for providing information on the effects of segregation as it is currently being used in U.S. prisons.

Only two recent studies were found that followed inmates for longer time periods after placement in segregation (Andersen et al., 2000; Andersen, Sestoft, Lillebaek, Gabrielsen, & Hemmingsen, 2003; Zinger et al., 2001). Andersen et al. (2000) studied participants over a 4 month period, but the majority of participants had data for less than a month. Zinger et al. (2001) followed inmates over a 60 day period. Both of these studies had high attrition rates (usually due to release from segregation), leading to a small percentage of participants who had complete data. Attrition is a major problem in longitudinal designs both for generalizability issues (i.e., are the participants who remain different from those who drop out) as well as analysis problems for those methodologies which require complete data from all participants (e.g., analysis of variance techniques). Newer methodologies developed for studying intra-individual change are less impacted by attrition rates. Although conclusions from these studies are limited by methodological weaknesses, both Andersen et al. (2000) and Zinger et al. (2001) demonstrated that segregated populations have more psychological disorders at the start than comparison subjects. However, these two studies provide conflicting evidence on whether conditions get worse over time. Thus, further longitudinal studies are needed to sort out these discrepancies and understand the long-term impacts of segregation.

THE COLORADO SYSTEM

In Colorado at the time of this study, there were four designated AS facilities. Colorado State Penitentiary (CSP) opened in 1993 as a 756-bed male AS facility in its entirety. At the Sterling Correctional Facility, 192 of its 2,545 beds were constructed to house male AS inmates in three units that are separate from the rest of the facility. The San Carlos Correctional Facility (SCCF) is a male acute care psychiatric prison, with nine units of varying security levels. One 26-bed unit at SCCF is designated for AS classified inmates. Generally, AS at SCCF is reserved for inmates already housed at SCCF needing high security or for inmates in AS at CSP or Sterling Correctional Facility whose psychiatric needs exceed those available at their current facility. The fourth AS facility is a 24-bed unit located at the multi-custody Denver Women's Correctional Facility. Be-

cause it houses the largest number of AS inmates and no other custody levels, CSP was the only AS site included in this study.

The Colorado Department of Corrections (CDOC) had 25 state and 7 private prisons that managed 19,279 inmates as of June 30, 2007, which marked the start of data collection. There are five security levels – minimum, minimum-restrictive, medium, close, and AS – to which offenders are assigned. CDOC uses a standardized, objective classification instrument that was developed specifically for the management of Colorado's inmate population (Austin, Alexander, Anuskiewicz, & Chin, 1995). The classification instrument is used to assign inmates to minimum through close security levels. However, AS is a long-term segregation placement for inmates who display violent, dangerous, and disruptive behaviors and placement is determined through an administrative action that is separate and distinct from both the usual classification system and the disciplinary system. Although disciplinary infractions may affect classification at all levels, the disciplinary process is a punitive response to a finding of guilt for an institutional rule violation and may result in punitive segregation, which can extend up to 60 days. Therefore, punitive segregation is of short duration used for punishment and AS is of long duration used for management purposes.

The administrative action to classify an offender to AS begins with a hearing, frequently following either a serious violation or a series of less serious infractions. Colorado does not house protective custody inmates; therefore, no AS placements occur at the request of inmates. Also, during the study, newly arrived inmates were not placed directly into AS upon intake into DOC except in rare cases for violent behavior in county jail or for an interstate compact case transferred from AS in another prison system. Although the disciplinary system only allows for punitive segregation *following* a finding of guilt, pre-hearing segregation (removal from population) may occur immediately following a serious incident for the safety and security of the facility. Therefore, in the time leading up to and during their AS hearing, inmates have typically been in segregation.

AS Offenders in Punitive Segregation

All facilities across the state of Colorado have punitive segregation beds with the exception of CSP and minimum security facilities. Minimum custody offenders are transported to a higher security facility to complete their punitive segregation time. When offenders are placed in punitive segregation, they are removed from the general population (GP) and taken to an isolated part of the facility to be placed in a single cell. Punitive segregation offenders remain in their cell for 23 to 24 hours a day, only coming out for recreation and showers, both of which are located within the living unit. Therefore, most do not leave the unit during their segregation time. Services including meals, library, laundry, and even medical and mental health appointments occur at the cell door. If a situation warrants an offender to be out of cell, the offender is placed in full-restraints and escorted to a room within the unit where he or she can meet with staff privately. Many offenders do not like being taken out of their cell unless absolutely necessary because of the use of full restraints. Additionally, they may not like leaving their cell because officers may take the opportunity to search the cell for contraband.

Due to the disciplinary nature of punitive segregation, offenders are stripped of most privileges during their stay. Punitive segregation inmates are neither allowed to work nor are they permitted to participate in programs or education. Furthermore, their televisions are removed, and they cannot order canteen beyond essential hygiene items.

Punitive segregation is a highly restrictive environment, only intended to be used for a short period of time. Once reclassified to AS, offenders may remain in a punitive segregation bed while waiting for an AS bed to become available. This can be problematic as GP facilities are not designed to house offenders in long-term segregation and the small number of punitive segregation beds at each GP facility can fill up quickly. Furthermore, while punitive segregation offenders are not afforded privileges, AS offenders are granted limited privileges such as visiting, which happens outside of the unit. Visitation is labor intensive because it requires escort by two correctional staff. In addition, while being held at an AS facility, offenders who behave well and complete their required programming and education are able to progress through a step program whereby they earn more phone sessions, visiting time, and privileges (e.g., TV, canteen). Only two punitive segregation facilities offer a step program for privileges, and there are none that provide the opportunity for programming or education. This means that while AS offenders are held in a punitive segregation bed, they are unable to begin working their way toward leaving segregation.

CSP Conditions of Confinement

Once an AS offender is moved from a GP facility and assigned to CSP, he is transported to CSP where he completes his AS time. Offenders are taken into CSP through intake, which is located on the lowest level of the facility. While in intake, offenders are placed in a holding cell that is similar to their permanent cell. During this time, the offender watches an orientation video that outlines what he can expect and what is expected of him during his time at CSP. He also has a brief visit from mental health, conducted at the cell door. While the offender is going through orientation, property staff assesses his belongings to ensure that no unallowable items enter with the offender, as they are permitted fewer property items than in GP facilities. This also prevents dangerous contraband such as drugs or weapons from entering the facility. Once the offender has completed orientation, usually within the first few hours, he is escorted to his permanent cell in a different area of the facility.

Physical Environment. CSP has six identical pods, or living units. When the offender enters the pod, he is escorted down a long hallway that opens into a circular area. In the center of the area is a tower with an office for housing unit staff on the lower level and the pod's control center on the upper level. Officers manning the control center operate all doors or sliders into the pod, including those to offenders' cells. Correctional staff standing in either the lower or upper levels of the tower can see into all eight of the day halls. Each day hall contains 15 to 16 offender cells separated onto two tiers with each tier having 7 or 8 cells, a shower, and a recreation room.

The cells in CSP are 80 square feet with 35 square feet of unencumbered floor space and contain a bunk, toilet, sink, desk, and stool. Each of these items is made of metal and is mounted to the wall or floor for security. Every cell has a 5" x 45" window on the exterior wall above the offender's bunk through which the offender can see outside. There is also a window on the cell door that faces the day hall. Depending on the pod, the window is either 3.5" x 20.5" or 5" x 15". Neither of these windows opens, which precludes the offender from receiving outside air while in his cell.

Per CSP policy, offenders wanting to participate in recreation are generally permitted at least one hour five times per week (as well as to shower for 15 minutes three times per week which generally coincides with an offer to exercise), assuming that there are no facility occurrences disrupting this schedule. When an offender is offered recreation and chooses to participate, he is placed in full-restraints and escorted from his cell to the recreation room at the end of the tier. The recreation room is a 90-square foot cell that contains a pull-

up bar mounted to the wall. No other exercise equipment is allowed. The only opportunity offenders have to receive fresh outside air is through two 5" x 60" grated windows on the exterior wall of the recreation room. On the interior, a glass wall faces the V-shaped day hall, so the offender in recreation is fully visible. Though prohibited by the facility, an offender in the recreation room may call out exercises to other offenders who in turn workout in their cells.

There are light and sound standards for CSP. Standards for CSP require that ambient sound does not exceed 70dBA during the day or 45dBA at night. A sound measurement of offender housing units at CSP, on a single day, returned an average of 55dBA at 7:50 AM and 42dBA at 10:40 PM. Although staff attempt to regulate the ambient sound of the facility, it can be difficult to regulate the noise level of 756 offenders; these measurements do not reflect periods of sound elevations produced by inmates' yelling and banging. Additionally, each offender is entitled to at least 20 foot-candles of light in the desk area of his cell. A light measurement of offender cells returned an average of 55 foot-candles of light in offenders' cells. Offenders have two 32-watt lights over the desk in each cell that they are able to control. In addition, each cell contains a 7-watt security light underneath the desk that stays on 24 hours per day.

Interpersonal Communication. Each cell has an intercom system through which correctional officers can contact each offender from the unit's control center. Officers use the intercom system to ask prisoners questions such as whether or not they want to attend recreation or take a shower. They also use the intercom to inform inmates when they will be leaving their cell for such things as a mental health visit, a family or friend visit, or if the offender will be escorted to another part of the facility or off grounds. Conversely, inmates can use the intercom system by pushing a button in their cell to contact staff, which they may do to request items (e.g., razor, toilet paper) or simply to chat. Staff also has the ability to monitor conversations using the intercom system.

While the intercom system provides a means for correctional staff and offenders to communicate with each other relatively easily, it does not afford offenders the opportunity to communicate with one another. Many offenders at CSP have become skilled in sign language. Since each day hall is V-shaped and cell doors have windows, offenders are able to communicate with each other using sign language. This aids in keeping the noise level down in the day hall and gives inmates the opportunity to speak to each other without the risk of staff overhearing. At times, however, many inmates simply yell through their cell door so that other offenders can hear. When this happens, the day hall can become very noisy.

Due to the safety concerns of the facility and the fact that moving an AS offender from his cell is staff intensive, offenders in AS receive many services at their cell door. At CSP, officers make rounds every 30 minutes to do a visual check into the cell of every offender. Mental health clinicians are required to do monthly rounds as well. During these rounds, clinicians go to the cell door of every offender in their assigned pod and check in with the inmate to see how he is doing. If the offender is well, the clinician moves on; however, if the clinician feels the offender needs follow-up, he or she will schedule an appointment with the offender for a later time. This appointment will be conducted in the visiting room, not cell side. In addition to rounds, offenders receive their library service and educational services at their cell door. Once a week, a librarian picks up library kites, or requests, and distributes books and magazines to offenders who put in a kite the previous week. When an offender is participating in programming or education, the teacher or counselor distributes homework to each inmate through the cell door and also collects completed assignments in the same manner.

Mental Health Services. In addition to mental health services received cell-side, offenders who are diagnosed with a mental illness receive more in-depth mental health services. Offenders with mental illness who are stable are offered a one-on-one session at least once every 90 days. Those with acute mental health needs are required to be seen at least once every 30 days. Although there are requirements on mental health staff to schedule appointments, offenders may refuse these appointments. Conversely, if an offender feels his mental health status has changed since his last monthly round, he may put in a request to see a clinician sooner than scheduled. If necessary, clinicians will schedule an offender for a mental health session for 1 to 2 hours per week as they are available; this is infrequent but most likely to occur following a crisis event. Additionally, if a mental health clinician feels a prisoner requires psychotropic medication, an appointment is made for him to meet with a psychiatrist. This visit may happen in a noncontact visiting booth or via teleconference.

Mental health appointments occur in a noncontact booth in the visiting room, unless the offender has declared a mental health emergency. If an offender has threatened self-harm, he is often taken to intake and placed in a special observation cell where he is stripped of his belongings and can easily be observed by staff for his safety and the safety of staff. An offender is kept in the observation cell until the clinician can make a reasonable assumption that the offender no longer plans to self-harm or for 72 hours, whichever comes first. If the clinician determines the offender needs to be observed beyond 72 hours, approval is needed from administrators and a mental health supervisor outside of the facility. Offenders who remain in a mental health crisis situation beyond the three to five day window are then sent to the infirmary at a different facility. There are generally four to six mental health clinicians who are responsible for managing the mental health needs of offenders at CSP. When the facility is fully staffed with six clinicians, each is assigned to a pod of 126 offenders, but when there are vacant positions, clinicians are required to cover their pod's mental health needs and split an additional pod with another clinician.

Quality of Life Program. When an offender arrives at CSP, his length of stay is indeterminate because it is based upon his behavior and ability to comply with programming requirements. The average length of stay at CSP is two years (O'Keefe, 2005). CSP provides incentive-based behavior modification and cognitive programs. Every offender must successfully complete three cognitive classes with each lasting three months. Successful completion of the required programming along with modeling appropriate behavior is the primary way for an offender to work his way out of CSP. The goal of these programs is to provide offenders with tools so they may be successfully reintegrated into lower security prisons.

CSP's incentive-based programming consists of three quality of life (QOL) levels. Each level brings with it more privileges; however, these privileges must be earned by the offender through appropriate behavior and compliance with CSP rules. Each level has a prescribed minimum number of days: 7 for level one, 90 for level two, and 90 for level three. Because offenders are required to complete three 90-day cognitive courses and there are often program waitlists that may result in an offender staying on levels two or three for longer than 90 days, the total program length is expected to last a minimum of one year. Additionally, offenders who misbehave may be regressed through the levels, extending their time in the program.

QOL level one is much like punitive segregation in that offenders are not permitted to have a television or to participate in programs or work. Furthermore, offenders at this level are only allowed one 20-minute phone session and one 2-hour noncontact visit per month, should they remain at level one for that length of time. They are able to order items from the canteen at a maximum of \$10 per week. Though limited in compari-

son to what GP offenders are able to buy, offenders at CSP have a variety of food, hygiene, faith, and personal items available for purchase. Additionally, AS inmates are permitted three library books at any given time. All other property must fit inside a 2 cubic feet duffle bag; however, as long as the property can fit in the bag, they are allowed two personal books, two magazines, and one newspaper. Other items that offenders at this level may have are photographs and an address book.

Level one offenders are automatically reviewed on their seventh day by the unit sergeant. Unless they received a negative write-up or report, offenders automatically progress to level two after seven days. Those who do not progress are extended another seven days until their next review.

Inmates become eligible for cognitive classes when they have been elevated to QOL level two. Offenders at this level are allowed a television, and if they are indigent and unable to afford one, the facility will loan one to them. This is beneficial as CSP provides some of their programs and recreational activities through the television. Offenders also receive 20 television channels that they are able to control from their cell and view at their leisure 24 hours per day. Also available through the television is a music channel that plays at designated times and rotates through music genres. Additionally, offenders have the opportunity to play bingo on a monthly basis. The bingo numbers are selected and aired over closed circuit TV at the facility. Offenders who wish to participate in Bingo receive six board games and are awarded a candy bar for each verified bingo.

In addition to programming received through their television, offenders at this level are permitted art supplies (colored pencils, art paper, drawing patterns, and coloring pictures), games (solitaire and kings table), puzzles (crossword, word fill-ins, word search, and Sudoku), and pamphlets for in-cell exercises offenders (push-ups, stretching, and isometrics). Offenders may request a new supply of colored pencils every six months and are able to receive four new sheets of art paper and new puzzles on a weekly basis.

At level two, offenders are permitted to increase their weekly canteen order to \$20 and have an increase in both their phone privileges, to two 20-minute phone sessions per month, and their visiting privileges, to two 2-hour noncontact visits per month. However, offenders at this level remain unable to work. Once an offender has completed a minimum of 90 days on level two, has been compliant with programming, has not had any negative write-ups for at least 90 days, has had appropriate interaction with staff, and has sustained suitable cell conditions, he may be progressed to QOL level three. Offenders' case manager initiates the paperwork for a level progression, which requires approval by the housing captain.

Arguably one of the most important benefits of QOL level three is an offender's ability to have more contact with friends and family. While offenders' visits remain noncontact, they are increased to four 3-hour visits per month and four 20-minute phone sessions. Offenders are also permitted to order as much as \$25 worth of canteen per week. One additional benefit is that offenders may now be eligible to work as a porter or barber. There are 54 positions available to offenders at CSP. Benefits to being offered a job position include the ability to earn money, increased time out of their cell, and two additional phone sessions per month. However, simply being at QOL level three does not automatically qualify an offender for a job. If intelligence officers feel the offender is a threat to the facility, he will not be permitted to work as a porter or barber. A QOL level three inmate may be deemed a continued threat due to an institutional history of assaultive behavior or from intelligence that suggests he may use the opportunity to intimidate or pass gang information or contraband to other offenders. There are no time limits restricting how long an offender can be in a job position and there is a waitlist of offenders who have put in a request to work; however, because of the

progression of offenders out of CSP and offenders who their work privilege, the same 54 offenders are not usually working for more than a couple of months.

The restrictions inherent in AS diminish staff's ability to impose traditional sanctions for institutional rule violations. Offenders in GP who are found guilty of a rule violation can receive a maximum of 60 days in punitive segregation or up to 180 days in loss of privileges (e.g., TV, canteen, visiting). Offenders in AS are required to follow the same institutional rules as GP offenders; however, because AS offenders are already in segregation for an indeterminate amount of time, they cannot receive additional segregation time as punishment. They can still lose privileges and be regressed through the QOL system. Sanctions are tailored to the seriousness of the infraction.

Offenders who engage in minor rule violations may initially receive a warning that is documented in a chronological record report. If the behavior continues, the offender may lose a privilege for a short amount of time (e.g., three days) without losing a QOL level. For example, this may happen if an offender covers the security light in his cell to make it darker for sleeping. This may also happen if an offender is caught "rat lining" or "fishing," which are forms of communication or exchange of items between offenders locked in their cells.

When an offender in AS violates a serious institutional rule, the officer initiates documentation on which he may recommend that the offender be regressed to a lower QOL level. This recommendation is approved or denied by a housing lieutenant. In general, if the lieutenant approves the offender's level regression, he is dropped one level. This process is kept separate from the disciplinary process, which may or may not result in a guilty finding, in order to have an immediate response to an offender's negative behavior. The disciplinary process can be lengthy because of due process requirements, but he may also receive a loss of privileges sanction through the disciplinary process.

Regardless of the offender's level, if he engages in behavior that dangerously disrupts the operation of the facility, he will be placed on special controls in the intake unit where he can be carefully monitored. This often happens during what is referred to as a use of force incident, which is any time an officer uses any level of force against an offender. A use of force incident generally occurs when an offender assaults a staff member or refuses to comply with a lawful order (e.g., refuses to be restrained for escort). An officer's response can include the use of simple pressure point tactics, the use of agents such as oleoresin capsicum (OC), or a forced cell extraction of the offender. During both fiscal years 2008 and 2009, CSP had an average of seven use of force incidents per month. Upon an offender's return to his cell, he will automatically begin at QOL level one again. Though the offender will not be required to retake any of the cognitive classes that he has already completed, he will be terminated from any classes in which he is currently enrolled and will be required to begin his process through the QOL levels again. Additional sanctions may be imposed through the disciplinary process.

Offenders who have difficulty progressing through the QOL level system may require special consideration. Offenders in segregation can accumulate a high number of sanctions through behaviors such as breaking the sprinkler head in their cells or overflowing the toilet in their cells, causing flooding on the tier. It is difficult to manage and change the behavior of offenders who have so many sanctions that there is no tangible incentive to improve their behavior. When this is the case, case managers and housing staff enact a behavior management plan. In a behavior management plan, case managers and correctional staff will use one privi-

lege (e.g., TV) that is highly valuable to the offender as an incentive. If the offender can behave well for a short period of time (generally 7 to 10 days), he may receive a television despite his loss of privilege status.

When an offender has been at level three for at least 90 days with good behavior and has successfully completed the requirements of the program, he is interviewed for progression out of CSP. A classification committee must approve the decision to reclassify him to close custody, and then he is moved to the Centennial Correctional Facility when a bed becomes available, where he continues to work toward completing his reintegration programming. It is less common that an offender transitions out of CSP any other way; however, offenders do sometimes parole from CSP or release when they reach the end of their sentence while in AS. Additionally, an offender may be released from AS based on a warden's review. An offender may receive a warden's review if he has been in CSP for more than two years but has been unable to progress out of CSP. If it is felt that the offender no longer needs to be in CSP, he may be released back to GP without transitioning through Centennial Correctional Facility.

Progressive Reintegration Opportunity (PRO) Unit. At the Centennial Correctional Facility, there is a continued focus on behavior modification and cognitive programs to transition disruptive offenders to less secure environments. Most offenders complete QOL levels four through six in the PRO unit. Upon transfer from CSP, offenders are reclassified from AS to close custody, the next highest custody level. Upon arrival, little is different for the newly classified close custody offenders; however, as offenders work their way through the PRO unit levels, they work toward contact visits with friends and family and are eventually allowed recreation time in the gym with other inmates. Ultimately, offenders who are successful in completing all six QOL levels are released back to GP.

Offenders with Mental Illness (OMI) Management Program. During the course of the research project, the OMI management program was opened at Centennial Correctional Facility. In addition to the PRO unit, the OMI program was designed to be a transitional program from CSP specifically for prisoners with a mental illness. Offenders are selected for the OMI program by a multi-disciplinary committee and must be approved for reclassification as a close custody inmate. In order to be considered for transfer to the program, offenders must have been in AS for a minimum of six months, enrolled in a cognitive program, have a mental health disorder, and be actively working with a mental health clinician.

Upon transfer to the OMI program, inmates are automatically placed in the intermediate program level. The OMI program has three levels: high, intermediate, and low. High is the most restrictive level with low the least. Depending on the individual's behavior, he can be moved to high or low levels. The program focuses on treatment and socialization. Offenders in this program work their way toward earning more privileges than are available in AS, contact visits with friends and family, and recreation in the gym with other inmates, much like PRO unit offenders do; however, the OMI program has the added benefit of group therapy. Initially, offenders are afforded the opportunity to participate in group therapy by being tethered to a special table. As offenders progress through the program, they are eventually allowed in groups of eight untethered inmates. The goal is to transition offenders to GP or the community although placements in the program may be long term.

San Carlos Correctional Facility (SCCF)

SCCF is a 255-bed special needs prison designed to stabilize and treat offenders with the most acute psychiatric symptoms or with developmental disabilities who are at risk for self injury as a result of their illness

and who have shown a substantial impairment in their ability to function at another correctional facility. SCCF houses inmates at all five custody levels. SCCF is unique in that offenders of all custody levels live and interact with one another on their living unit, with the exception of AS offenders who are housed in a separate unit.

All offenders who arrive at SCCF are processed through the intake/assessment unit. New arrivals are interviewed by both the mental health clinician assigned to the unit and a psychiatrist. New offenders are not permitted interaction with other inmates for the first 72 hours. If after 72 hours, clinicians and correctional staff feel the offender can reasonably interact with other offenders, he will be allowed in the day hall with as many as five other inmates. Offenders on the intake unit are permitted out of their cell in the day hall for at least one hour a day, five days per week. During this time, they have open access to the phones and showers.

Offenders typically progress through the programming levels as their mental health status improves. Offenders are continually monitored by a psychiatrist with an appointment every 30 days for the most severe offenders or every 60 days for those who are progressing well. One-on-one sessions occur with a mental health clinician as needed and are not scheduled on a regular basis; however, there is a clinician assigned to each unit, with each unit housing fewer than 30 inmates.

As an offender continues to progress through the facility, he will work his way towards open access to the day hall, phones, and shower. As he progresses through the facility he will then be allowed out with seven inmates and then fifteen, eventually earning all day open access. Those who have progressed to the lowest levels are also permitted one hour of recreation five days per week in the yard or gym plus three hours per week at the library. Additionally, they are able to participate in group therapy sessions, which happen once or twice a week depending on the topic. Group therapy subjects include anger management, understanding one's mental illness, and other related topics. Once mental health, psychiatric, and correctional staff determine that the offender has improved enough to function in GP, he is then transferred to a facility at his custody level.

PURPOSE OF PRESENT STUDY

The broad purpose of the project was to evaluate the psychological effects of long-term segregation on offenders, particularly those with mental illness. This study examined conditions as they existed in the Colorado prison system with respect to AS, using CSP as the AS study facility. Only males were included because females represent 2% of Colorado's AS population. We did not assign inmates to segregation, but studied those conditions as they naturally occurred. The following were the primary goals and hypotheses of the grant.

Goal 1: To determine which, if any, psychological domains are affected, and in which direction, by the different prison environments. A multitude of psychological dimensions were examined, drawing from those most often cited in the literature. The broad constructs of interest were depression/hopelessness, anxiety, psychosis, withdrawal and alienation, hostility and anger control, somatization, hypersensitivity, and cognitive impairment. We hypothesized that offenders in segregation would develop an array of psychological symptoms consistent with the SHU syndrome, with elevations across the eight constructs.

Goal 2: To assess whether offenders with mental illness decompensate differentially from those without mental illness. We were particularly interested in whether long-term segregation had a differential impact based on the presence of mental illness in offenders. We sought answers to the following questions: Does AS exacerbate symptoms in offenders with mental illness? Does AS create symptoms of mental illness in those who did not exhibit any at placement? It was hypothesized that offenders with and without mental illness would deteriorate over time, but the rate at which it occurred would be more rapid and more extreme for the mentally ill.

Goal 3: To compare the impact of long-term segregation against the general prison setting and a psychiatric care prison. In this study, the psychological and behavioral symptoms of offenders in AS were compared to similar offenders who were sent to SCCF or returned to the general prison population pursuant an AS hearing. This study used a repeated measures design over the course of a year to explore whether psychological distress was attributable to the various prison environments. It was hypothesized that inmates in segregation would experience greater psychological deterioration over time than the comparison groups.

This study also included an examination of individual characteristics such as mental health status, personality, and trauma history to determine if certain factors could predict patterns of change. The prediction analyses were exploratory in nature and we did not formulate a hypothesis about the variables that might predict differential rates of psychological decompensation.

METHOD

GROUP ASSIGNMENT

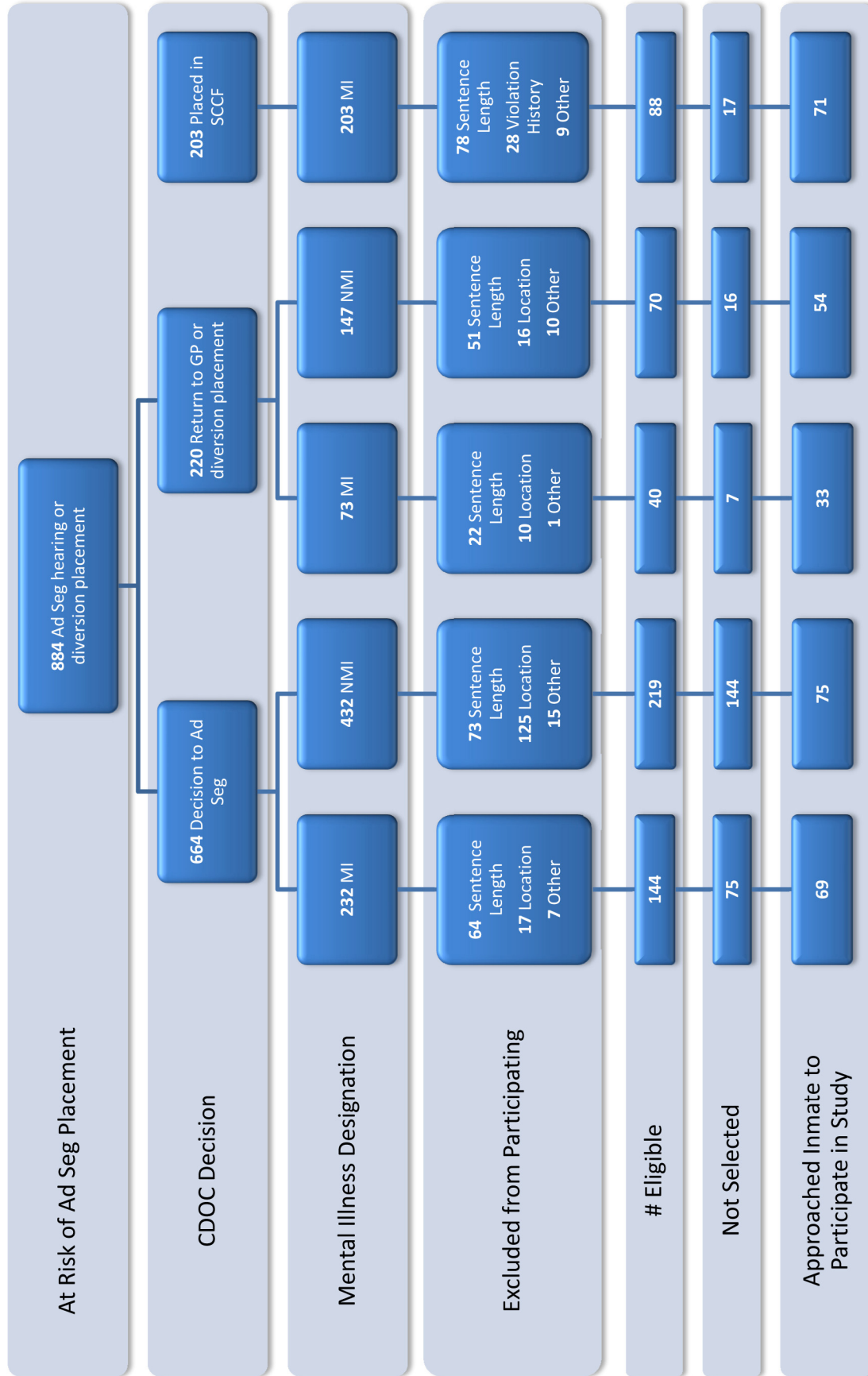
Study participants included male inmates placed in AS and comparison inmates in the GP. Placement into AS or GP conditions occurred as a function of routine CDOC operations, pending the outcome of their AS hearing, without involvement of the researchers. Inmates were identified as study candidates at the point the offenders were notified that they would have an AS hearing. Oftentimes, it was unknown whether a particular inmate would be placed in AS or returned to GP at the time of his study consent; approximately 10% of hearings do not result in AS placement. For the purposes of this study, all study participants classified to AS were waitlisted for and placed in CSP (as opposed to Sterling Correctional Facility). Inmates who returned to GP following an AS hearing were assumed to be as similar as possible to AS inmates and, therefore, comprised the comparison groups. Comparison participants also included inmates targeted for a diversionary program that identified inmates at high risk of AS placement due to their disruptive behavior. This program discontinued shortly after the study commenced, hence few participants were identified through this method.

Inmates in both of these settings (CSP, GP) were divided into two groups – offenders with mental illness (MI) and with no mental illness (NMI). There are fewer inmates with mental illness than without, but because both subgroups were of equal interest to this study, separate groups enabled over-selection of inmates with mental illness. All offenders are rated on a psychological needs level by trained clinicians upon intake into CDOC and periodically during their incarceration as warranted. The psychological needs level has a 5-point rating, where higher values indicate the need for more intensive services, and a qualifier code that indicates whether the offender has a serious and persistent mental disorder. Most inmates rated 3 through 5 have an Axis I diagnosis, although certain Axis II diagnoses may infrequently warrant this rating (e.g., borderline, schizotypal). Disorders that typically qualify as serious and pervasive are mood disorders including major depression, other depressive disorders, dysthymic, and bipolar disorders; psychotic disorders including schizophrenic, paranoid, delusional, and schizophreniform disorders; dissociative identity disorder; and posttraumatic stress disorder. In this study, inmates assessed with a psychological needs level of 3 through 5 were defined as MI and levels 1 or 2 were defined as NMI.

A third comparison group was included. This group included inmates with severe mental health problems placed in SCCF. Of the inmates placed in SCCF, only those with patterns of prison misbehavior, as measured by disciplinary violations, were included in the study. However, inmates placed into AS at SCCF were excluded because of the small number and because many had transferred from AS at CSP or Sterling Correctional Facility, where the effects of the earlier placement would be unknown. The purpose of the SCCF comparison group was to study inmates with serious mental illness and behavioral problems who were managed in a psychiatric prison setting.

Figure 1 illustrates the number of offenders who were eligible for the study and details the selection of offenders within each of the five study groups. Given that the purpose of this project was to study long-term segregation, inmates projected to release from prison before administration of the final testing session were excluded. Inmates were also excluded if they could not read English or if their reading level was not high enough (roughly eighth grade) to complete the battery of tests. SCCF inmates were excluded if they did not have significant disciplinary violations in their history. Infrequently, offenders were excluded for other reasons such as being an interstate compact offender, being the suspect in a high-profile murder investigation (as reason for AS placement), or a visual impairment prohibiting them from reading. Finally, inmates were sampled as a matter of convenience. Because this project funded only one field researcher, participants were selected based on their proximity by either timing or location to others who could be included in this study.

Figure 1. Eligibility and Selection of Study Participants



PARTICIPANTS

Figure 2 details the flow of participants through the study, including an account of how many offenders completed the testing at each interval. A total of 302 male inmates were approached to participate in the study. Thirty refused to participate. Two more offenders were considered a passive refusal and were removed for inappropriate sexual behavior towards the researcher during the first testing session. An additional 23 offenders later withdrew their consent, although the data collected to the point of their withdrawal was used. In addition to refusals and withdrawals, 10 inmates released prior to the end of the study due to discretionary releases by the Parole Board and one GP participant died of a drug overdose.

Five testing sessions were initially established at 3-month intervals, beginning with the date of consent and initial administration. Therefore, tests were scheduled at 3 months, 6 months, 9 months and 12 months after the baseline assessment. However, this schedule was problematic for the CSP groups. When the study began, there was a 3-month average wait for inmates to be transferred to CSP due to a shortage of AS beds. While on the waitlist, AS inmates were held in a punitive segregation bed at their originating facility. It was determined that the primary goal was to study inmates in a single long-term segregation facility (CSP) to limit confounding variables and that therefore the baseline measure should be collected upon placement into CSP. However, it was also recognized that significant changes could occur while inmates were held in segregation at their originating facility. Therefore, a “pre-baseline” measure was collected as close to the AS hearing as possible, which meant that the CSP groups completed six test intervals rather than five. The time between the pre-baseline and baseline measure varied according to how long the inmate was on the waitlist. The median time between pre and baseline tests was 99 days, although eight offenders were moved into CSP so quickly that they did not have a pre-baseline measure. In the analyses, tests were aligned across groups according to the test number, such that the CSP groups had an additional test at the end rather than at the beginning.

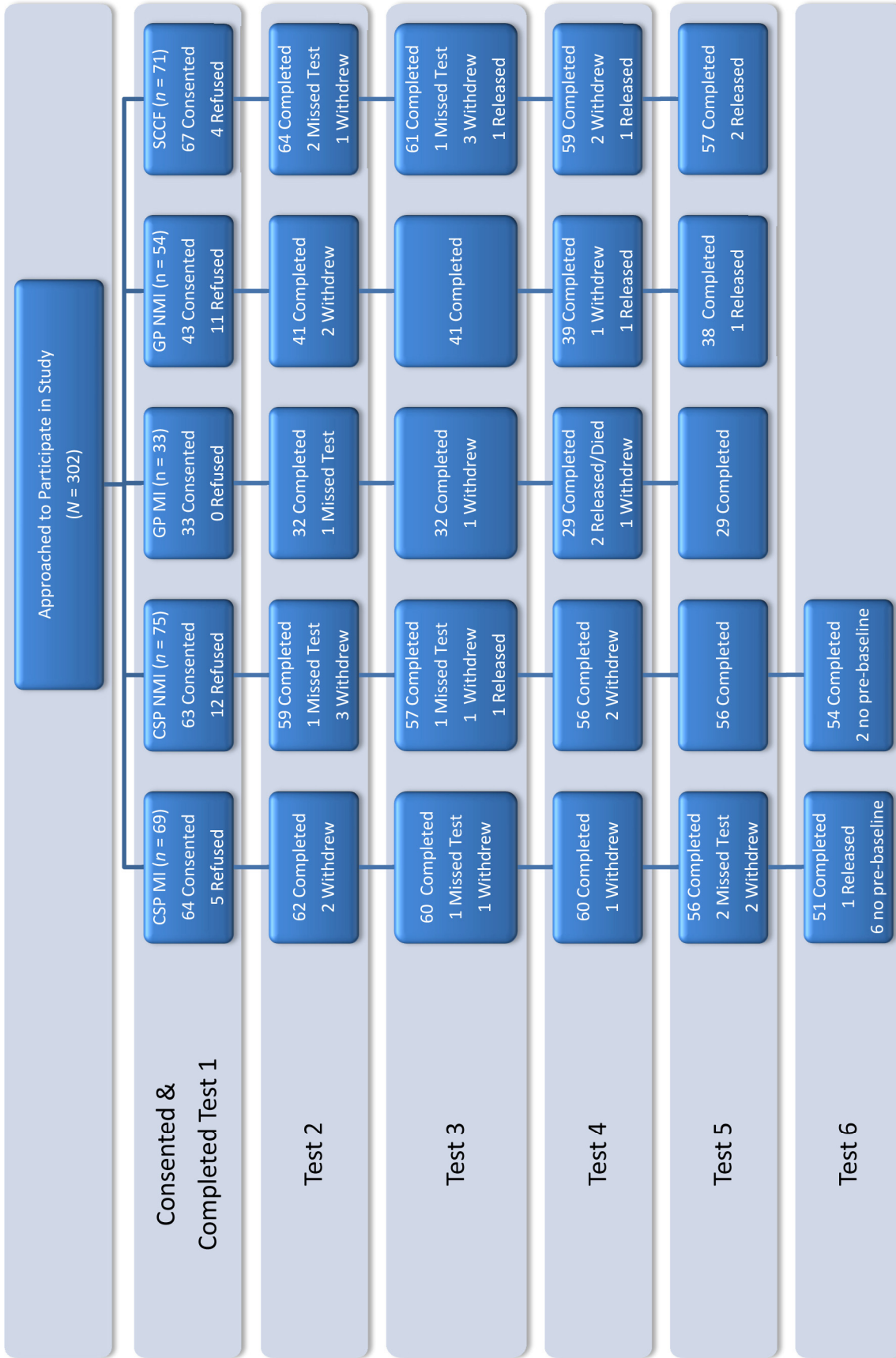
Participants’ ages ranged from 17 to 59 at the time of consent, with a mean age of 31.8 ($SD = 9.1$). The racial/ethnic breakdown of participants was 40% white, 36% Hispanic, 19% African American, 4% Native American, and 1% Asian. Of the inmates with mental illness who were included in this study, 56% were identified with a serious and pervasive disorder. Other participant characteristics are described in greater detail in the results section, including comparisons of study samples to eligible pools and comparisons of refusers to participants.

MATERIALS

Assessment tools were selected to comprehensively cover the variety of psychological constructs associated with AS (e.g., Arrigo & Bullock, 2008; Grassian, 1983; Haney, 2003). The primary constructs assessed in this study were as follows: (1) anxiety, (2) cognitive impairment, (3) depression/hopelessness, (4) hostility/anger control, (5) hypersensitivity, (6) psychosis, (7) somatization, and (8) withdrawal/alienation. Additionally, malingering, self-harm, trauma, and personality disorders were assessed.

Research materials were selected to meet the following criteria: (1) use of assessments with demonstrated reliability and validity, (2) use of multiple sources for providing information (e.g., self-report, clinician ratings, files), (3) use of multiple assessments of each construct of interest, (4) ability to use within the prison setting, and (5) ease of administration, including no specialized equipment, no physical contact, short length of time, and appropriate reading level.

Figure 2. Flow of Participants through Study



After selection of the self-report assessments was complete, there remained several areas of interest (e.g., panic disorder, hypersensitivity to external stimuli, physical hygiene) for which there was no established measure that met our criteria. In conjunction with the study advisory board, the research team developed a 39-item instrument to assess these areas. This instrument, called the Prison Symptom Inventory (PSI), is shown in Appendix A.

In addition to self-report assessments, ratings of psychological functioning were obtained from clinical staff and ratings of behavior in the housing unit were obtained from correctional staff. Official record data were also gathered from electronic and paper files. This section summarizes information for self-report assessments, staff ratings, and behavioral data. Complete descriptions of the individual measures and their known psychometric properties from past research and for the current study are provided in Appendix B. Additional analyses of the psychometric properties of the PSI are presented in Appendix C.

Data were collected directly from participants on 12 self-report assessments (ten paper-and-pencil tests, two administered by the researcher) to assess 12 different constructs. Table 1 provides a list of the assessment tools for each construct. Most assessments were collected at each testing period, although personality disorders, self-harm, and trauma history were not collected at all time periods. It was determined that personality and trauma history were relatively stable constructs that needed to be assessed only once to limit the testing burden on study participants. Also, due to the burden on already limited mental health resources, the BPRS was only administered at the first, third, and fifth testing intervals.

Table 1. Assessments and Constructs

	Anxiety	Cognitive Impairment	Depression – Hopelessness	Hostility – Anger Control	Hypersensitivity	Psychosis	Somatization	Withdrawal – Alienation	Malingering	Personality Disorder	Self-Harm	Trauma
Beck Hopelessness Scale (BHS)			I									
Brief Psychiatric Rating Scale (BPRS)												
Activity												
Anxious-Depressed	C		C									
Hostility/Suspiciousness				C								
Thought Disorder						C						
Withdrawal								C				
Brief Symptom Inventory (BSI)												
Anxiety	I											
Depression			I									
Hostility				I								
Interpersonal Sensitivity					I							
Obsessive-Compulsive	I											
Paranoid Ideation						I						
Phobic Anxiety	I											
Psychoticism						I						
Somatization							I					
Coolidge Correctional Inventory (CCI)										I		
Deliberate Self-Harm Inventory (DSHI)											I	
Personality Assessment Screener (PAS)												
Acting Out				I								
Alienation								I				

	Anxiety	Cognitive Impairment	Depression – Hopelessness	Hostility – Anger Control	Hypersensitivity	Psychosis	Somatization	Withdrawal – Alienation	Malingering	Personality Disorder	Self-Harm	Trauma
Anger Control				I								
Health Problems							I					
Hostile Control				I								
Negative Affect	I		I									
Psychotic Features						I						
Social Withdrawal								I				
Suicidal Thinking			I									
Prison Behavior Rating Scale (PBRS)												
Anti-Authority				O								
Anxious-Depressed	O		O									
Dull-Confused		O										
Prison Symptom Inventory (PSI)												
Panic Disorder	I											
Hypersensitivity/External Stimuli					I							
Physical Symptoms							I					
Profile of Mood States (POMS)												
Anger-Hostility				I								
Depression-Dejection			I									
Fatigue-Inertia							I					
Tension-Anxiety	I											
St Louis Univ Memory Scale (SLUMS)		R										
State-Trait Anxiety Inventory (STAI)												
State Anxiety	I											
Trait Anxiety	I											
Structured Inventory of Malingered Symptomatology (SIMS)									I			
Trail Making Test (TMT)		R										
Trauma Symptom Inventory (TSI)												I

Note. C = Clinician rating; I = Inmate self-report; O = Officer rating; R = Researcher administered. Shaded tests not administered at every testing interval.

Self-Report Assessments

A composite score was developed for seven of the eight primary constructs by standardizing scores from the scales on the self-report assessments. Standardized scores were used so that comparisons between constructs could be made more easily and to create a single measure for constructs assessed by multiple self-report assessments. Scores were standardized by centering on the mean of the entire sample at the first assessment and dividing by the standard deviation. A composite score was computed by standardizing each assessment and averaging the standardized scores across the individual assessments as the composite score. Reliabilities for these composites are presented in the discussion of each construct.

Anxiety Construct. Anxiety was measured by eight self-report variables assessed at each time period. The self-report measures used to create the anxiety composite score were the State and Trait subscales from the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970); the Obsessive-Compulsive, Anxiety, and Phobic Anxiety subscales from the Brief Symptom Inventory (BSI; Derogatis, 1993); the Negative

Affect subscale from the Personality Assessment Screener (PAS; Morey, 1997); the Tension-Anxiety subscale from the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992); and the Panic Disorder subscale from the PSI. The following PSI items were included on the Panic Disorder subscale: 2, 6, 10, 13, 16, 17, 20, 25, and 30.

Internal consistency reliabilities were computed for each assessment period for the entire sample. The mean Cronbach's alpha across individual anxiety measures and time periods was .87 (range = .60 to .95). The Cronbach's alphas for the composite ranged between .89 and .91 for the six time periods. Reliabilities were similar across testing intervals, and they were similar to internal consistency estimates from normative samples. Test-retest correlations between sequential time periods ranged between .49 and .86 ($M = .76$) indicating reasonable stability over 3 month assessment periods. The validity coefficients between self-assessments of the anxiety construct indicated evidence for convergent validity, with correlations between measures ranging from .36 to .85 ($M = .65$) across all time periods.

Cognitive Impairment Construct. Cognitive impairment was assessed by two individually administered tests. The Saint Louis University Memory Scale (SLUMS; Tariq, Tumosa, Chibnall, Perry, & Morely, 2006) was used to assess orientation, memory, attention, and executive function. The SLUMS is an 11-item scale and yields a single total score ranging from 0 to 30, where higher scores indicate stronger cognitive abilities. The Trail Making Test (TMT; Reitan, 1958) was used to assess attention. The time required to complete the A (connect sequential numbers) and B (connect alternating numbers and letters) tasks were collected, and the ratio of times (B/A) was used as the attention measure in subsequent analyses.

The SLUMS demonstrated low internal consistency with a mean Cronbach's alpha of .52 across groups and time periods (range = .48 to .60). We could not find comparative information on this newly developed measure. Because this is a multidimensional measure of cognitive function, internal consistency may not be the correct assessment of quality. The correlations between sequential time periods ranged from .38 to .84 ($M = .67$), indicating good test-retest reliability. The Trails B/A ratio and SLUMS total score were negatively correlated (range = -.17 to -.31), as would be expected because the tests are scaled in opposite directions; however, these correlations are fairly small, indicating that these two measures are assessing different cognitive functions. Because of the weak correlations between the SLUMS and TMT, each of these assessments was used individually to assess cognitive impairment rather than combining them to yield a composite score.

Depression-Hopelessness Construct. The depression-hopelessness construct was assessed using five self-report measures. The scales used to create this construct were the Beck Hopelessness Scale (BHS; Beck & Steer, 1993), the BSI Depression subscale (Derogatis, 1993), the PAS Negative Affect and Suicidal Thinking subscales (Morey, 1997), and the POMS Depression-Dejection subscale (McNair et al., 1992).

Internal consistency reliabilities were computed for each assessment period for the entire sample. The mean Cronbach's alpha across depression measures and time periods was .87 (range = .60 to .96). The Cronbach's alpha for the composite ranged between .71 and .77 ($M = .75$) for the six time periods. Internal consistency estimates for the subscales were similar to reliabilities from normative data. The test-retest correlations for the depression-hopelessness composite were strong ($M = .76$, range = .57 to .90) indicating good stability over time. The validity coefficients between self-assessments of the depression-hopelessness construct indicated good convergent validity with estimates ranging from .35 to .89 ($M = .60$) across all measures and time periods.

Hostility-Anger Control Construct. The hostility-anger control composite was assessed using five self-report measures: the BSI Hostility subscale (Derogatis, 1993); the Anger Control, Hostile Control, and Acting Out subscales on the PAS (Morey, 1997); and the POMS Anger-Hostility subscale (McNair et al., 1992).

Internal consistency reliabilities were computed for each scale at each assessment period for the entire sample and a mean Cronbach's alpha of .62 (range = .27 to .94) was obtained. The Cronbach's alphas for the composite ranged between .54 and .61 ($M = .57$) for the six time periods. Although these reliabilities were lower than expected, the smaller internal consistency estimates were for the scales with a small number of items (i.e., PAS subscales with two items) and these reliability estimates are similar to other literature. The correlations between sequential time periods ranged between .56 and .84 ($M = .75$) and suggest that the hostility composite is stable over 3 month periods. The validity coefficients between self-assessments of the hostility-anger control construct were quite variable with validity coefficients ranging between .11 and .84 ($M = .42$) across all measures and time periods; it was the PAS Acting Out and Hostile Control subscales that tended to have lower correlations for this composite. These lower correlations along with the lower composite internal consistency estimates suggest a potential multidimensional construct. Because the composite was stable and the different aspects of hostility-anger control were relevant to this study, all subscales were kept together for the composite measure. Analyses were conducted without the PAS subscales and the overall study results did not change substantially (results available from the authors upon request), thus all measures were included as part of the composite.

Hypersensitivity Construct. The hypersensitivity construct was measured by two self-report measures—the Hypersensitivity to External Stimulus subscale of the PSI and the Interpersonal Sensitivity subscale of the BSI (Derogatis, 1993). Items 1, 7, 31, 34, and 37 were included on the PSI Hypersensitivity to External Stimulus subscale. This composite is assessing two different aspects of hypersensitivity—environmental and interpersonal.

Internal consistency reliabilities computed for each scale at each assessment period for the entire sample indicated highly variable internal consistency estimates (.22 to .86) with a mean estimate of .56. However, examination of each scale showed that the BSI had strong internal consistency estimates (.71 to .86) whereas the PSI has low estimates (.22 to .39). The PSI was created by the researchers and its purpose was to capture variables not measured by existing measures, thus it may not be a homogeneous construct. Although internal consistency estimates of the composite were low (.47 to .61 with $M = .53$), the composite showed good test-retest reliability (.21 to .80 with a mean of .63) and the correlations between these two subscales provided evidence of convergent validity (range = .31 to .44); thus these scales were analyzed in the rest of the study as a composite variable. Analyses using each measure separately are available from the researchers upon request.

Psychosis Construct. The psychosis construct was assessed by three self-report measures. These included the Paranoid Ideation and Psychoticism subscales of the BSI (Derogatis, 1993) and the Psychotic Features subscale of the PAS (Morey, 1997).

Internal consistency estimates for the subscales ranged between .62 and .83 ($M = .77$) and estimates for the composite ranged between .73 and .80 ($M = .78$) indicating adequate internal consistency estimates for this composite and its components. Internal consistency estimates for the subscales were similar to those found with normative samples. Test-retest correlations between sequential time periods indicated strong stability over time (range .52 to .87 with a mean correlation of .71). The validity coefficients between self-

assessments of the psychosis construct provided evidence of convergent validity, ranging between .35 and .79 ($M = .63$) across all measures and time periods.

Somatization Construct. The somatization construct was measured by four self-report assessments, including the Somatization subscale of the BSI (Derogatis, 1993), the Health Problems subscale of the PAS (Morey, 1997), the POMS Fatigue-Inertia subscale (McNair et al., 1992), and the Physical Symptoms subscale of the PSI. Items 5, 8, 11, 15, 19, 24, 27, and 28 were included on the PSI Physical Symptoms subscale.

The mean Cronbach's alpha across somatization measures and time periods was .79 (range = .56 to .94) and for the composite the mean alpha was .77 (range = .73 to .79). Test-retest reliability estimates were strong with correlations ranging between .58 and .86 ($M = .76$). The correlations between the self-assessments of the somatization construct indicated good convergent validity with coefficients ranging between .38 and .67 ($M = .54$) across all measures and time periods.

Withdrawal-Alienation Construct. The withdrawal-alienation construct was assessed using two PAS subscales—Alienation and Social Withdrawal. Internal consistency reliabilities were computed for each assessment period for the entire sample and the median Cronbach's alpha across withdrawal-alienation measures and time periods was .75 (range = .69 to .83). The Cronbach's alphas for the composite ranged between .62 and .71 ($M = .67$) for the six time periods. Correlations between sequential time periods (range = .49 to .87; $M = .68$) indicated stability. Reliabilities were similar across testing intervals and were similar to reliabilities found in the normative samples. The correlations between the subscales used in the withdrawal-alienation construct indicated good convergent validity with coefficients ranging between .45 and .55 ($M = .51$) across time periods.

Malingering. The Structured Inventory of Malingered Symptomatology (SIMS; Widows & Smith, 2005) was used to assess malingering on mental health disorders. Scores on five subscales (Psychosis, Neurologic Impairment, Amnesic Disorders, Low Intelligence, and Affective Disorders) were obtained at each testing period. The SIMS was used in this study as one of the tools to determine if a participant's responses may be truthful.

The subscales of the SIMS tended to be positively correlated (range = .19 to .63; $M = .51$) with each other. The median Cronbach's alpha across malingering subscales and time periods was .76 (range = .50 to .93). Lower correlations and reliability estimates tended to be with the Affective Disorder and Low Intelligence subscales.

The SIMS manual provides cut-off scores to suggest malingering on each of the subscales as well as a total score. The cut-offs were scores greater than 1 for the Psychosis subscale and scores greater than 2 for the Neurological Impairments, Amnesic Disorders, Low Intelligence, and Affective Disorders subscales. The total SIMS scale cut-off included scores greater than 14.

Personality Disorders. The Coolidge Correctional Inventory (CCI; Coolidge, 2004) was utilized to identify personality disorders among individuals. For this study, the CCI was used to assess 14 personality disorders identified in the current and past American Psychiatric Association's (1980, 2000) Diagnostic and Statistical Manuals (DSM): Antisocial, Avoidant, Borderline, Dependent, Depressive, Histrionic, Narcissistic, Obsessive-Compulsive, Paranoid, Passive-Aggressive, Sadistic, Schizoid, and Schizotypal. The CCI also has other subscales to assess, among others, DSM Axis I variables, neuropsychological functioning, and response validity.

For this study we also used the CCI measures of Axis I and personality disorders (Axis II). These variables have been hypothesized as potential predictors of the impact of segregation on psychological distress. Because personality disorders are considered relatively stable constructs, this measure was given only at the baseline assessment period. Therefore, they were not included in the change over time measures. The median Cronbach's alpha across CCI subscales was .75. The Cronbach's alphas ranged between .46 and .88 for different subscales.

Self-Harm Construct. The Deliberate Self-Harm Inventory (DSHI; Gratz, 2001) was used to assess the deliberate self-harm history at the initial assessment. The data obtained from the DSHI was coded to provide a quantitative severity rating based on the frequency of the self harming behavior and whether or not the behavior resulted in hospitalization. This variable was considered to be a potential predictor of outcomes. The baseline assessment was used to assess lifetime history of self-harm and each harming behavior was coded as *having occurred in lifetime* or *not occurring*. Scores were summed across the 17 items for a total score. This measure is meant to be given as an interview rather than a paper-and-pencil test; we modified to fit the testing situation. We had hoped to use this assessment as a repeated measure; however, misunderstanding of instructions did not allow for integrity of the data and only the lifetime assessment of self-harm was used as a potential predictor of outcomes. The internal consistency estimate for the total score was .84 indicating that it is reasonable to sum the 17 indicators into a total score.

Trauma. The Trauma Symptom Inventory (TSI; Briere, 1995) was used to assess the ongoing impact of traumatic history. This measure was selected as a potential predictor of outcomes. This was administered once at the second assessment period. Participants use a 4-point rating scale for frequency of occurrence (0 – *never* to 3 – *often*) of 100 events (e.g., flashbacks, wanting to cry, feeling jumpy) experienced within the last 6 months. Scores are obtained on 3 validity scales and 10 clinical subscales. For this study, the total score was used. The Cronbach's alpha for the total score was .97.

Staff Ratings

Two measures were completed by prison staff to assess the constructs of interest. The Brief Psychiatric Rating Scale (BPRS; Ventura, Lukoff, Nuechterlein, Liberman, Green, & Shaner, 1993) was completed by clinical staff and the Prison Behavior Rating Scale (PBRS; Cooke, 1998) was completed by correctional officers and case managers.

Clinician Ratings. The BPRS (Overall & Gorman, 1962) is a 24-item scale most commonly used to assess patients with psychiatric disorders. It is designed to assess rapidly changing symptoms (Lukoff, Nuechterlein, & Ventura, 1986; Ventura et al., 1993). It measures positive symptoms, general psychopathology, and affective symptoms. Some items can be rated after observation of the patient; others require clinical interview to obtain the patient's self report information. Each of the 24 symptom constructs are rated on a 7-point scale of severity ranging from 1 (*not present*) to 7 (*extremely severe*).

Research has indicated that there are five factors: Thought Disorder, Withdrawal, Anxious-Depressed, Hostility-Suspiciousness, and Activity (Burger, Calsyn, Morse, Klinkenberg, & Trusty, 1997; Hedlund & Vieweg, 1980). The BPRS subscales and total scores demonstrated low internal consistency with alpha estimates ranging between .40 and .66 ($M = .55$); these estimates are lower than those found with normative samples. The correlations between sequential time periods ranged from .23 to .58 ($M = .40$), indicating moderate stability over a 6 month period. The BPRS subscales had low correlations with self-report measures of the same

underlying construct, with validity correlations ranging between .03 and .49 among the corresponding measures and the average validity coefficients of the BPRS with all self-report assessments at .28. The Anxious-Depressed subscale had the strongest correlations with the self-report measures and Withdrawal had the lowest. In general, the BPRS scales had low scores, indicating a possible floor effect (see means in results section) and impacting variability as well as relationships between measures.

Correctional Staff Ratings. The PBRs was designed to assess psychological features common to prison life (Cooke, 1998). The instrument was developed for a British prison population. Therefore, some words that are not common in the U.S. were changed to be culturally appropriate (see Appendix A). Correctional staff rated 36 behaviors using a 4 point rating scale (0 – *never/rarely*; 1 – *sometimes*, 2 – *often*, 3 – *most of the time*) at each of the six time periods. There are three scales: Anti-Authority, Anxious-Depressed, and Dull-Confused. All items were summed to provide a total score. Internal consistencies were good for the PBRs scales with a mean Cronbach’s alpha across groups and times of .93 (range = .90 to .95) for the Anti-Authority scale, .91 (range .90 to .95) for the Anxious-Depressed scale, and .83 (range = .78 to .87) for the Dull-Confused scale. Total score internal consistency estimates ranged from .94 to .95. Test–retest reliabilities were highly variable with correlations ranging between .08 and .50. Correlations between testing periods were lowest from first to second assessments and tended to increase over time, which might be a function of familiarity. Correlations with self-report measures tended to be highly variable and mostly small (-.06 to .46), as they were with clinician ratings (.08 to .16).

Official Records Data

Data from official records were collected primarily from the Department of Corrections Information System (DCIS), which is an administrative database of offender data. Offender characteristics to include demographic history, criminal history and offense data, institutional behavior, and needs levels were electronically downloaded. Inmates are routinely processed through the diagnostic unit upon intake into prison, and data are gathered through various sources including arrest and pre-sentence investigation records, diagnostic interview, and pencil-and-paper tests.

Two standardized tests administered to all inmates at the diagnostic unit were included in this study to describe the population. These were the Level of Service Inventory – Revised (LSI-R; Andrews & Bonta, 1995, 2003) and the Tests of Adult Basic Education (TABE; CTB/McGraw-Hill, 1994). The LSI-R is a semi-structured interview tool that assesses criminal risk, with information verified through official records. The LSI-R total score ranges from 0 to 54 and is used to assign the level of supervision for community-based offenders and to determine allocation of services (Motiuk, Motiuk, & Bonta, 1992). The LSI-R showed moderately strong predictive validity ($r = .31$) for 1-year recidivism rates with Colorado parolees (O’Keefe, Klebe, & Hromas, 1998). The TABE is designed to measure adult proficiency in reading, mathematics, language, and spelling. It gives the information needed to place learners in the appropriate lessons for their particular skill deficiencies. Final scoring of the tests can yield grade equivalent scores. The correlation between the TABE total battery score and the GED average score was .63 (CTB/McGraw-Hill, 2004).

Resulting from the diagnostic assessment process are ratings across different needs levels, including academic, vocational, sex offender, substance abuse, medical, psychological, intellectual disabilities, assaultiveness, and self-destruction. Each level is rated on a 5-point scale, where scores of 3 through 5 indicate problem areas. Similar to the other scales, a psychological rating of 3 or greater indicates the need for mental health services. Levels may be reevaluated during an offender’s incarceration.

Institutional behavior, such as disciplinary violations and involvement in gangs, are recorded electronically over the course of an offender's incarceration. Disciplinary violations are grouped into three categories according to their seriousness. Because patterns were similar when analyzing either violation type or total violations, only totals are reported. There are three levels of gang involvement: member, associate, and suspect. Levels are ascertained by field intelligence officers who rate offenders' involvement across 11 items (e.g., self admission, moniker, gang tattoos, identification by law enforcement). Each item carries a weight ranging from 5 to 20 points, and summative scores determine the degree of gang membership or involvement. To clearly delineate offenders actively involved in gangs, only those scored as gang member were considered to have gang involvement in the following analyses.

Certain data elements were collected only for study participants during the course of their participation in the study. The following were collected and coded for the period of time between each testing interval for each participant: the amount of time spent in various settings (e.g., segregation, GP, hospital), phone records, and mental health crisis data. Additionally, activity logs from paper files for the CSP participants were collected and coded.

Phone records were received electronically from the Colorado Inmate Phone System (CIPS). From these records, researchers coded the number of phone calls attempted, the number of calls completed, and the time spent on the phone across all calls.

Mental health staff is required to make a written report in DCIS following any unscheduled mental health visit or crisis. All reports completed for participants during their participation in the study were reviewed and coded by researchers on a 3-point self-harm scale (1 – *ideation*, 2 – *self-harm behavior*, 3 – *attempted suicide*) and whether or not there was a report of a psychotic symptom during the crisis.

Pod activity records are kept by CSP correctional staff and are updated on a daily basis to provide information on an offender's time outside of his cell for shower, exercise, and porter duties. These forms also track the number of times each offender refused or was not offered these activities. Data were coded to reflect a refusal or an activity not offered on a specific day as well as the actual amount of time the offender spent participating in the activity. When the records were unclear or no information was recorded on a specific day, it was coded as unknown. Researchers coded the pod activity sheets for each offender between each testing interval and summed for the number of refusals, days an activity was not offered, unknowns, and average time spent for shower and exercise activities.

PROCEDURES

Study enrollment began July 2007 and ended March 2009, with final testing of all participants completed in March 2010. The project operated under the approval of the institutional review board at the University of Colorado at Colorado Springs (UCCS).

The research team was notified of AS hearings by the case management supervisor at each facility and of SCCF placements by the clinician who scheduled the facility transfers. Notification typically occurred before the hearings or SCCF placement to give the field researcher maximal lead time. Researchers reviewed electronic records to screen inmates for study eligibility.

Per the UCCS institutional review board, a stipulation was added to provide greater protection to inmates with mental illness. Before consenting them, researchers were required to contact mental health staff, who

in turn were asked to assess whether the offender would be able to understand the consent form and to weigh the study risks against the benefits. Other than the SCCF group, there were rarely issues. However, it was not uncommon for the SCCF clinician to wait several days or even occasionally weeks for a new arrival to stabilize prior to giving researchers approval to consent participants; these inmates were then included in the study. Two inmates were excluded from the study because clinicians did not believe they had the capacity to fully understand the consent process; both were SCCF inmates.

The field researcher was a female university employee who completed the full CDOC training academy and had a CDOC badge that permitted her unescorted access to the facilities. In advance of each visit, the field researcher contacted prison security to arrange visits with specific inmates. All inmates were escorted by security staff to the visiting room, which contained a noncontact booth for inmates in AS or punitive segregation conditions. The field researcher met individually with each inmate to review the consent form, which included the general purpose of the study, voluntary nature of participation, risks and benefits, and remuneration. Inmates were advised that the purpose of the study was to learn about their adjustment to prison and offenders in prisons across the state were being included in this study. Inmates who agreed to participate were given \$10 for each testing interval. Although this amount may at first seem high for AS inmates who do not have an opportunity to earn income, it was important that AS inmates were compensated at the same rate as GP inmates since the activities were exactly the same. Additionally, all deposits into inmate bank accounts were subject to a 30% restitution recovery fee and deposits to inmates with negative balances (common among AS inmates) were subject to a 50% reduction of the deposited amount. Therefore, actual payments ranged from \$2 to \$7.

Inmates were screened for their native language and reading abilities. Although this was done when determining study eligibility, the field researcher further assessed them at the time of consent. The testing battery was not available in alternative languages and it was determined that using interpreters could negatively impact the validity of the tests. However, the field researcher attempted to include inmates with borderline English or reading skills by helping them to understand difficult words. Eighteen inmates across the five study groups were specifically excluded from the study for lacking adequate language or reading abilities.

At the time of consent, the initial test battery was administered. The field researcher instructed participants to read the directions for each test. Instructions were highlighted by researchers when there was an indication on the test to respond with respect to a certain timeframe (e.g., in the past week). The field researcher administered the timed TMT and the SLUMS tests, and she assisted if they had questions, most frequently with the definition of a word. The researcher collected the test packet immediately following its completion, so it was not ever handled by security staff. At the same time, she visually scanned the packet before the inmate was returned to his cell to ensure that he had not inadvertently skipped a test or section of items.

Prior to leaving the facility, the researcher conducted a further review of inmates' responses for indications of intent to harm self or others. There were no items that assessed intent to harm others, but numerous items were identified as potential indicators of suicide ideation. Participants were notified at the time of consent that confidentiality would be broken if they responded affirmatively to any of these items. When participants endorsed a suicidal item, the field researcher notified mental health staff and the principal investigator immediately. Mental health staff then followed up with each case following notification to assess the seriousness or intent to self-harm. There were no participant suicides during the course of the study.

The field researcher distributed the PBRS to housing staff at each testing interval and collected the completed forms upon return visits to the facility. Mental health clinicians were generally notified that a BPRS was needed a couple weeks prior to the researcher testing to give them time to complete the assessment.

In the CSP groups, 18 out of 127 participants were consented and tested prior to their AS hearing. On average, CSP participants completed their initial test 7 days ($SD = 7.3$) after their AS hearing. Thirteen participants in the GP groups were selected from the diversion program (for being at risk of AS placement) and seven were tested prior to an AS hearing. On average, however, GP participants were tested 16 days ($SD = 18.9$) after their hearing or placement into the diversion program. At the time of consent and the initial testing, 43% of inmates had been confined in segregation (40% in AS groups and 3% in GP groups) for an average of 18.2 days ($SD = 18.1$). SCCF participants were tested within 13 days of placement on average ($SD = 8.9$).

Participants' data were kept in two separate databases. The eligibility database tracked the eligible pool of offenders, such as identifying information, current location, date of AS hearing or SCCF placement, expected release date, psychiatric status and clinician approval, selection into study or reason for exclusion, and date of consent or refusal. A testing schedule for study participants was incorporated into the database, which also had reporting capabilities in order to manage the project. A separate database tracked participants' responses to the standardized tests; no identifying information was included in this database other than a secure researcher-assigned identification number. Both databases were stored on a secured server with access restricted to the project researchers.

RESULTS

DATA ANALYSIS PLAN

We first present results that speak to the quality of the research design, addressing issues concerning sampling and group representativeness; comparing those who participated fully, partially, or refused to participate; evaluating the fidelity to confinement conditions; and examining the validity of self-report responses. Following these analyses, we present results addressing the hypotheses of interest. This study had three goals and related hypotheses:

- To determine which, if any, psychological domains are affected, and in which direction, by the different prison environments; it was hypothesized that offenders in segregation would develop an array of psychological symptoms consistent with the SHU syndrome, characterized by elevations across the eight constructs.
- To assess whether offenders with mental illness decompensate differentially from those without mental illness in AS by testing the hypothesis that both groups will get worse over time but that the rate of deterioration would be greater for the mentally ill.
- To compare the impact of AS against other prison conditions by testing the hypothesis that inmates in segregation experience greater psychological deterioration over time compared to inmates in other confinement conditions.

To test the first hypothesis, one sample t-tests are completed to see if study groups are significantly different from normative data on the study measures at each time period.

To test the second hypothesis, analysis of variance statistical techniques are used to assess if the AS groups have differential change over time. Comparisons are made on mean change over time for each construct for the mentally ill and non-mentally ill groups in AS confinement conditions.

To test the third hypothesis, analysis of variance statistical methods are used to assess mean change over time and groups for each construct of interest. In particular, it is of interest to determine whether there is a significant interaction between time and group to indicate that there is differential change over time depending on condition of confinement. An analysis is completed for those with different mental illness status. That is, the mentally ill group in AS is compared to the mentally ill groups in the general prison and in the psychiatric prison, whereas the non-mentally ill in AS are compared to the non-mentally ill in the general prison population.

Mean difference statistical results for all three analyses are supplemented with effect size measures assessing proportion of variance accounted for by the time and group variables. Significant main effects will be further investigated using pairwise comparisons to explore group differences and comparisons between means at consecutive time periods to explore time effects. If there is a statistically significant interaction, simple main effects exploring change over time for each group will be completed. All statistical tests are completed at the .05 significance level.

In addition to the analysis of variance methods to explore mean change over time, regression analysis is used to predict change over time using individual variables as potential predictors. Change over time is assessed by computing an individual slope estimate for each person on each construct of interest. Predictors

include demographic variables, criminal history variables, personality variables, and confinement conditions. Within each section we describe the data analytical tools used to complete the analyses.

SAMPLING

Group Representativeness

Because random assignment procedures were not engaged, comparisons of offender characteristics across variables routinely collected in DCIS were conducted between eligible inmates and study participants to determine the study sample's representativeness (see Table 2). Some data are dynamic and, therefore, these data represent those that were current for each offender at the point of his eligibility for the study. The institutional behavior measures of disciplinary violations and prior AS placement were collected over their entire incarceration up to study eligibility.

Table 2. Representativeness of CSP Study Groups to Eligible Pool

	CSP MI			CSP NMI		
	Sample (<i>n</i> = 64)	Eligible Pool (<i>n</i> = 232)	<i>p</i>	Sample (<i>n</i> = 63)	Eligible Pool (<i>n</i> = 432)	<i>p</i>
Demographics						
Mean age (<i>SD</i>)	31.2 (9.7)	32.1 (9.2)	n.s.	30.0 (9.9)	30.4 (8.5)	n.s.
Ethnicity/Race			n.s.			n.s.
White	41%	45%		19%	27%	
Hispanic	33%	32%		54%	55%	
African American	19%	17%		22%	16%	
Other	8%	6%		5%	2%	
High school achievement			n.s.			n.s.
HS diploma	12%	12%		10%	13%	
HS equivalency	51%	45%		54%	58%	
Neither	37%	43%		36%	30%	
Test of Adult Basic Education						
Mean reading score (<i>SD</i>)	8.7 (3.6)	8.0 (3.6)	n.s.	7.8 (3.3)	8.6 (3.6)	n.s.
Mean math score (<i>SD</i>)	6.7 (2.5)	6.3 (2.8)	n.s.	6.7 (2.5)	7.2 (3.0)	n.s.
Mean language score (<i>SD</i>)	7.7 (4.0)	7.1 (4.1)	n.s.	7.2 (3.8)	7.6 (3.9)	n.s.
Mean total score (<i>SD</i>)	7.7 (3.5)	7.1 (3.5)	n.s.	7.4 (3.4)	7.8 (3.5)	n.s.
Sentence and Criminal History						
Mean prior incarcerations (<i>SD</i>)	.5 (0.9)	.5 (0.9)	n.s.	.4 (0.8)	.4 (0.7)	n.s.
Mean felony class 1 – 6 (<i>SD</i>)	3.4 (1.1)	3.7 (1.1)	.02	3.2 (1.1)	3.5 (1.1)	n.s.
Mean LSI-R (<i>SD</i>)	35.3 (7.4)	34.8 (6.9)	n.s.	33.1 (5.8)	33.0 (6.6)	n.s.
% Sentenced for violent crime	67%	54%	.03	70%	59%	n.s.
Institutional Behavior						
Mean # disc. violations (<i>SD</i>)	22.0 (27.5)	20.7 (20.1)	n.s.	13.2(10.8)	13.9 (14.1)	n.s.
% Prior AS placement	38%	38%	n.s.	32%	29%	n.s.
% Gang member	30%	33%	n.s.	43%	45%	n.s.
Need Levels (% scored 3-5)						
% Academic	42%	45%	n.s.	41%	37%	n.s.
% Vocational	83%	82%	n.s.	87%	83%	n.s.
% Medical	23%	17%	n.s.	10%	9%	n.s.
% Substance abuse	83%	80%	n.s.	71%	81%	n.s.
% Sex offender	44%	33%	n.s.	30%	22%	n.s.
% Intellectual disability	11%	10%	n.s.	3%	3%	n.s.
% Anger	69%	61%	n.s.	70%	64%	n.s.
% Self-destruction	34%	25%	n.s.	10%	9%	n.s.

Nonparametric chi-square and *t* test analyses were conducted for both sets of group comparisons. There were no differences between the CSP NMI study sample and eligible pool. The only difference for the CSP MI group was that study participants had a more serious felony offense, as measured by felony class (class 1 is most serious and class 6 is least) and percent with a violent crime, than individuals in the eligible pool.

Refusals

The field researcher asked inmates who refused to participate or who withdrew their consent for their reasons. Half of them gave no reason for doing so. Of those who listed their reasons, 10 inmates stated general disinterest, 6 were skeptical of the research, 4 feared retaliation from their gang or other inmates for participating, 3 listed monetary reasons, and 3 expected imminent release due to an appeal. Chi-square analyses and *t*-tests were conducted between study participants and inmates who refused to participate in the study or withdrew their consent to determine if significant differences existed (see Table 3). The only measured difference between the two groups was that participants had higher LSI-R scores, which indicates higher recidivism risk.

Table 3. Comparison of Refusals to Study Participants

	Refusals	Participants	<i>p</i>
Demographics	(<i>n</i> = 55)	(<i>n</i> = 247)	
Mean age (<i>SD</i>)	33.2 (10.5)	31.7 (8.9)	n.s.
Ethnicity/Race			n.s.
White	44%	40%	
Hispanic	33%	37%	
African American	20%	18%	
Other	4%	5%	
High school achievement			n.s.
HS diploma	23%	13%	
HS equivalency	42%	56%	
Neither	36%	32%	
Test of Adult Basic Education			
Mean reading score (<i>SD</i>)	8.2 (3.6)	8.5 (3.5)	n.s.
Mean math score (<i>SD</i>)	7.1 (3.1)	6.6 (2.8)	n.s.
Mean language score (<i>SD</i>)	7.9 (4.0)	7.3 (3.9)	n.s.
Mean total score (<i>SD</i>)	7.8 (3.4)	7.5 (3.5)	n.s.
Sentence and Criminal History			
Mean prior incarcerations (<i>SD</i>)	.3 (0.6)	.5 (0.8)	n.s.
Mean felony class 1 – 6 (<i>SD</i>)	3.2 (1.1)	3.4 (1.1)	n.s.
Mean LSI-R (<i>SD</i>)	31.4 (7.4)	34.3 (7.3)	.02
% Sentenced for violent crime	70%	60%	n.s.
Institutional Behavior			
# Disciplinary violations	16.9 (24.0)	15.8 (16.8)	n.s.
% Prior AS placement	26%	23%	n.s.
% Gang member	22%	28%	n.s.
Need Levels (% scored 3-5)			
% Academic	42%	39%	n.s.
% Vocational	87%	83%	n.s.
% Medical	13%	19%	n.s.
% Substance abuse	70%	79%	n.s.
% Sex offender	35%	31%	n.s.
% Intellectual disability	15%	9%	n.s.
% Anger	72%	60%	n.s.
% Self-destruction	24%	23%	n.s.

Complete and Incomplete Testers

There were 222 participants who completed all testing sessions of the study; thus only 18% of participants did not have all self-report assessments for every time period. There were a number of reasons why participants did not complete all testing periods: some withdrew their consent, others were paroled before the end of the study, and some were not available for a specific testing interval (e.g., out to court for extended trial). There was not a significant differential incompleteness rate across the five study groups, $\chi^2(4, N = 270) = 3.71, p = .45$, with incompleteness rates of 25% for CSP MI, 16% for CSP NMI, 18% for GP NMI, 15% for GP MI, and 18% for SCCF. Comparisons were made between those who did and did not complete all assessments on demographic, background variables, and the dependent variables. To compute a score on the dependent variables, the mean across scores for available time periods was computed for the self-report composites and cognitive variables. Table 4 provides information on these comparisons. Participants who did not complete the entire study had significantly higher self-destruction needs, higher mean hostility composite scores, and lower cognitive function as demonstrated by significantly lower scores on both measures of cognitive performance (SLUMS, Trails B/A).

Table 4. Comparison of Incomplete to Complete Testers

	Incomplete	Complete	<i>p</i>
Demographics	(<i>n</i> =48)	(<i>n</i> =222)	
Mean age (<i>SD</i>)	31.4 (8.7)	34.1 (10.6)	n.s.
Ethnicity/Race			n.s.
White	49%	39%	
Hispanic	34%	36%	
African American	13%	20%	
Other	4%	5%	
High school achievement			n.s.
HS diploma	12%	19%	
HS equivalency	57%	44%	
Neither	31%	37%	
Test of Adult Basic Education			
Mean reading score (<i>SD</i>)	8.6 (3.5)	7.7 (3.7)	n.s.
Mean math score (<i>SD</i>)	6.6 (2.8)	7.1 (3.3)	n.s.
Mean language score (<i>SD</i>)	7.4 (3.9)	7.5 (4.1)	n.s.
Mean total score (<i>SD</i>)	7.6 (3.5)	7.4 (3.6)	n.s.
Sentence and Criminal History			
Mean prior incarcerations (<i>SD</i>)	0.5 (0.8)	0.4 (0.8)	n.s.
Mean felony class 1 – 6 (<i>SD</i>)	3.5 (1.1)	3.2 (1.2)	n.s.
Mean LSI-R (<i>SD</i>)	34.0 (7.5)	33.3 (7.5)	n.s.
% Sentenced for violent crime	65%	61%	n.s.
Institutional Behavior			
# Disciplinary violations	15.1 (15.4)	22.5 (28.8)	n.s.
% Prior AS placement	22%	27%	n.s.
% Gang member	27%	29%	n.s.
Need Levels (% scored 3-5)			
% Academic	37%	43%	n.s.
% Vocational	84%	85%	n.s.
% Medical	18%	15%	n.s.
% Substance abuse	78%	72%	n.s.
% Sex offender	32%	30%	n.s.
% Intellectual disability	9%	13%	n.s.
% Anger	60%	64%	n.s.
% Self-destruction	21%	36%	.04

