

**ARE MEN FORMERLY HOUSED IN SOCIAL ISOLATION IN PRISONS AND  
JAILS BECOMING PSEUDO-AUTISTIC?**

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**Dedication**

This dissertation was dedicated to B. N. and all those individuals who have endured solitary confinement for unbearable amounts of time. May this study provide you some insight for what you went through and continue to go through.

### **Acknowledgements**

For an entire year I volunteered at the California Prison Focus, a legal advocate support program that had me reading letters directly from the men in the Secure Housing Units (SHUs) in the various prisons in the California Department of Corrections and Rehabilitation (CDCR). It was a profound experience reading their stories, touching the paper that touched their hands, and connecting with them indirectly through their powerful words of suffering. It taught me the value of the importance of social interaction and revolving one's self around people, something they were starving for. Working directly with the men segregated in the SHUs of San Quentin and Pelican Bay State Prison as part of the Oakland, CA. Salvation Army Adult Rehabilitation Center were my hypothesis took shape. Hearing their complaints and symptoms combined with having a fascination with the impact on the recently discovered mirror neuronal system and being socially separated, contributed to developing my hypothesis. My gravitation to all of these issues stemmed from relating to having been personally socially isolated during my childhood when I experienced a heightened lucid awareness during a complete comatose state for a long time. I could relate to having similar symptoms of feeling socially alienated, not relating to others and some of the unique autistic symptoms this study intended to measure. I could empathize with hearing the men's testimonials and ongoing symptoms they reported to me in their conversations over the Internet and on the phone. Coping with the ongoing struggle of finding subjects, they continuously inspired me to push forward to help give them answers as to why they were feeling the way they did.

This process taught me not only patience but excelled my proficiency in submitting written proposals, advanced my strengths with literature reviews, how to communicate with state and federal professionals in this field and molded my ability to be professionally assertive and confident in my decision-making abilities in forensic psychology. The experience of being repetitively rejected inspired me to look at other potential channels to make this dissertation possible. This process took away my sense of helplessness that no longer had me avoiding situations I feared or believing that goals were out of my reach. Instead, I have acquired an improved awareness about myself, and an acquired courage and strength that by not having gone through such a rigorous journey would have deprived me of such exponential growth.

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### Abstract

**Objective:** The unique symptoms seen in formerly incarcerated men after being housed in solitary confinement negatively impacts their lives and the chances of success once they are released. Could inactivity of the mirror neuron system, which is responsible for empathy, language, and motor skills, be producing autistic symptoms in these men? The hypothesis was that men held in segregation would have more individuals who tested positive above the cut off score on the Adult Autism Quotient-10 when compared to those never held in segregation. Pseudo-autism is distinguished by having symptoms and associated symptoms of an autism spectrum disorder except meeting the DSM-5 criteria of having had the symptoms present during an early developmental age. **Methods:** Participants were given the AQ-10 (N = 60) and the Ritvo Autism and Asperger's Diagnostic Scale-Revised (RAADS-14), both screeners used to red flag potential diagnoses of autism. The RAADS-14 and additional questions were given to assess for pre-existing cases of autism. The use of a step-wise multiple regression analysis, and a Mann-Whitney U were utilized to measure the predictor variable on autistic symptoms reported on the AQ-10 and the RAADS-14.

**Results:** A step-wise multiple regression analysis was used and pre-existing diagnoses (ADHD, Learning Disorder, Developmental Coordinating Disorder, and Schizophrenia) and time variables (time out of segregation and time in segregation) were used as predictor variables. Only a pre-existing ADHD diagnosis significantly predicted performance on the AQ-10 ( $F(4, 55) = 3.446, p = .014$ ). The regression showed that the predictors only accounted for 20% of the variance in the performance on the AQ-10. A stepwise regression on the RAADS-14 total with the same predictor variables similarly



reported only a pre-existing ADHD diagnosis having significant results ( $F(4, 55) = 3.869$ ,  $p = .008$ ) for predicting autistic symptoms. A Mann-Whitney test found that for present day autistic symptoms reported on the “RAADS-14, there was a significant difference between those housed in segregation a short amount of time (Mean = 40.70) as compared to longer amounts of time (Mean = 55.83) in segregation ( $U = 807.500$ ,  $p = .008$ ).

**Conclusion:** The main hypothesis of this study found that there is no relationship of current autistic symptoms as reported on the AQ-10 with time in segregation. The secondary hypothesis did show that men housed in segregation longer than one week reported an increase in current autistic symptoms. This may reflect autistic symptoms, other diagnoses with similar symptomology or a continuum of symptomology that may be a result of segregation impacting the mirror neuron system.

*Keywords: solitary confinement, segregation, mirror neurons, autism spectrum disorders, Adult Autism-Spectrum Quotient, Ritvo Autism and Asperger Diagnostic Scale Revised, Romanian orphans,*

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## **Chapter I. Introduction**

### **Introduction to the Problem**

Prisons in the United States have increasingly relied on the use of social isolation to manage difficult prisoners, for implementing “punitive segregation” or for the practice of protective custody (; Browne, Cambier, & Agha, 2011; Haney, 2003). Statistics have shown that in 2011-12, 4.4% of prison inmates and 2.7% of jail inmates are held in segregation on any given day (Beck, 2015) and an estimated 20% of inmates in prisons and 18% in jails overall have been housed in solitary confinement in the last 12 months (Beck, 2015). Little attention has been given to the impact of segregation that contributes to the symptomatic causes of recidivism (Gordon, 2014). Recent statistics also confirm that individuals who are socially isolated exhibit exacerbated antisocial behavior, mental health problems, increased assaultive behaviors, and when re-entered directly into the community they recidivate at higher rates when compared to those housed in general population (Browne et al., 2011; Jacobson, 2012; Lovell & Johnson, 2004).

When compared to men housed in non-solitary confinement, isolated prisoners displayed higher levels of adjustment disorders and longer durations of non-improvement in the reduction of symptoms, or continued to suffer permanent impairment because of the unique nature of the social isolation (Grassian, 2006). Compared to prisoners housed in general population, these prisoners were also found to be more likely to commit suicide and inflict self-harm (Haney, 2003; Hayes, 1988; Hresko, 2006; Kaba, Lewis, Glowa-Kollisch, Hadler, Alper, Selling, MacDonald, Solimo, Parsons, & Venters, 2014). Prison incarceration practices and environments in general harm the individuals incarcerated and the communities that they are returned to (Haney, 1997).

### **History of the Use of Solitary Confinement**

Originally implemented in the 1800s with the Quaker ideal that emphasized seclusion and penitence, social isolation was intended to promote social reform, rehabilitation, and internal change from inside the prisoner's minds and themselves (Grassian, 2006; Haney & Lynch 1997). Confined in social isolation and sensory deprivation for only a short amount of time, prisoners also displayed a unique conglomeration of symptoms, including descent into an impaired mental stupor, incapacity to manage incoming stimuli, and hypersensitivity to any type of external stimuli (Grassian, 2006). In evaluating segregated prisoners for the court case of *Madrid v. Gomez* in 1993, Grassian (2006) found characteristics similar to an "Acute Organic Brain Syndrome" like a rare psychotic disorganization or psychosis not seen anywhere else.

Soon after recognizing the devastation of the psychological and physical distress due to solitary confinement back in the mid-1800s, the practice of isolation was discontinued (Grassian, 1983; Hresko, 2006). The practice ended as a result of the documented cases that ranged from highly confused states, florid delirium, severe paranoia, to aggressive and violent behaviors (Grassian, 2006). Since the 1980's, there has been a resurgence in the penitentiary system to cope with the rise in prison violence, gang involvement, and other disciplinary reasons or personal reasons by the creation of more "Supermax" or maximum security prisons that have more isolation cells (Haney & Lynch, 1997; Hresko, 2006; Smith, 2006).

Today, prison administrators designed the "Supermax" with the intention to house prisoners, the "worst of the worst" with extreme minimal social contact for

“serious disciplinary violations” or are considered a danger to others or the safety of the prison such as gang members (Haney & Lynch, 1997; Hresko, 2006; Kupers, 2008).

Many individuals are placed into segregation with pre-existing mental illnesses and conditions, which often times is the disciplinary reason they are placed in social isolation in the first place (Kupers, 2008). Similarly, Kupers (2008) detailed how individuals with mental disorders tend to spend more time in segregation.

The historical accounts of what prisoners experienced psychologically in isolation without social contact has often been compared to a process similar to mirroring, a reflection of the development of the self by another person’s presence (Haney & Lynch, 1997). The prisoners in isolation were removed from social contact and the meaning of their “self” was deprived of essential feedback from the environment necessary for identity formation and “selfhood” (Cooley, 1902; Haney & Lynch, 1997; Mead, 1925). We look to others and in them see identity-forming reflections of ourselves”, the “looking glass self” where “we appear as selves in our conduct insofar as we ourselves take the attitude that others take toward us” (as cited in Haney & Lynch, 1997, p. 503). A man’s image of himself is a process defined by how he sees others and society defines him to provide him stability (Bogardus, 1992; Cooley, 1902). Who we are and how we see ourselves is contingent on the feedback others give us. Schachter (1959) described how individuals have a strong need to connect with others to interpret one’s own emotional state, especially emotional arousing states (Haney, 1997; Schachter, 1959). Without social feedback as seen in social deprivation, what is found are a variety of dysfunctional psychological states (Haney & Lynch, 1997).



### **Defining Social Isolation**

To understand the context of being socially deprived, several different deliberate practices are implemented to regulate minimum human interaction. By today's standards, being placed in segregation or the secure housing units (SHUs) within the prisons of the California Department of Corrections and Rehabilitation, it is defined as the prisoner being removed from mainline prison population for being considered a threat and subjected to increased punishment for sometimes indefinite periods of time (Haney & Lynch, 1997). The individual spends at most an hour to hour and half rarely outside his cell, is rarely in the presence of other people, and often have limited views of the outside (Haney, 2003). Although most definitions of isolation vary drastically, systematically segregation conditions result in the individual being unable to hear or see other prisoners (Amnesty International, 1980) and they experience a reduction of normal stimulation and no physical contact with other prisoners (Haney & Lynch, 1997). Typically housed in a cell 60 by 80 square feet wide, they have limited to no ability for normal conversations, or vocational/education training programs (Browne et al., 2012; Haney, 2003),

Some isolation cell prisoners are placed alone in a stark room about the size of a king-sized bed from between twenty-two and twenty-three hours a day, often stripped of personal possessions, reading material, and window access (Hresko, 2006). In Pelican Bay State Prison, the solid metal doors on each of the cells were built for safety by preventing objects from being thrown but also block vision and light (*Madrid v. Gomez*, 1995).

Common day practices include the placement of prisoners in a harsh environment under continual technological surveillance with no social contact and physical touch

limited to the hand of the correctional officer placing restraints through the steel door (Riverland 1999, Smith, 2006). Prisoners housed in the Supermax SHUs are often watched by camera and communicated through intercoms rather than through direct contact (Haney, 2003,) and rotate through facilities that have shower and cell doors operated remotely from a central control center (Riverland, 1999). Often defined by a broad set of conditions across federal and state correctional systems, this study operationalized social isolation as the individual having been housed in either a prison or jail cell alone for at least a minimum of 22 hours a day, about an hour of yard exercise a day, and five out of seven of the days of the week with minimum human interaction and visual and acoustic sensory input (Amnesty International, 1980; Grassian, 2006; Hresko, 2006).

Prisoners housed in the SHUs do not have access to the same privileges as those in general population, including limited if no visitations, recreations, or television (Haney, 2003; Haney & Lynch, 1997; Smith, 2006). Letters written by prisoners inside the SHUs with details of prison conditions from the various California prisons, consistently describe multiple accounts of limited social communication through deprivation of personal visits, access to normal prison privileges and activities, and limitations imposed to incoming mail and packages. Not only are visitations sometimes prohibited for a year or more, they are usually conducted through a glass window preventing human touch (Browne et al., 2011). If prisoners are taken out to exercise they are secluded to a room referred as “dog run”, an open caged, cement-walled area (often a bare room with an open barred top) that when exposed to extreme weather conditions are instructed to stay in their cells (Browne et al., 2011; Haney, 2003, p.126). Family visits,

or often “video visits” are often conducted by videoconferencing equipment rather than direct contact, similar to the tele-medicine and tele-psychiatry practices where prisoners needs are addressed over television screens (Haney, 2003, p. 126). The primary intent of segregation is seen by the experiences of having no opportunities to have social interactions or normal conversations with others, they are denied any type of human touch, affection or caring from others or for themselves (Haney, 2003, p.127). Often times, social interaction from mental health workers or counselors is controlled through the cell door (Browne et al., 2011).

### **Symptoms in Segregation**

Prisoners held in segregation consistently display a “specific psychiatric syndrome” featured by sensory hyper-responsivity to stimuli, perceptual distortions, heightened anxiety, difficulties with concentration and memory, intrusive thoughts, paranoia, and/or difficulties with impulse control (Grassian, 2006, p. 335-337). Isolation causes a psychological stress that not only results in difficulties with concentration, sleep disturbances, impaired cognition, and increased social conflict, but also higher rates of anxiety symptoms, social withdrawal, confused thought process, emotional flatness, emotional swings, and overall deterioration (Haney & Lynch, 1997, p. 506).

Increasing numbers of prisoners housed have displayed expansive acute reactions, including similar elaborate symptoms as seen in individuals with Post-Traumatic Stress Disorder (Haney, 2003, p. 132). Grassian (2006) found long-term effects of social isolation resulted in similar chronic post-traumatic stress symptoms, including continuous hyper-vigilance, helplessness, flashbacks, and lasting dramatic personality changes which revolve around a pattern of pronounced social withdrawal and an elevation of anger and

fear when forced to socialize (Grassian, 2006, p. 353; Hinkle & Wolff, 1956).

Grassian (2006) described prisoners experiencing a “harm” which manifested itself by: ...a continued intolerance of social interaction, a handicap which often prevents the inmate from successfully readjusting to the broader social environment of general population in prison and perhaps more significantly, often severely impairs the inmate’s capacity to reintegrate into the broader community upon release from imprisonment” (p. 333).

Grassian (2006) discussed how the worst cases of individuals housed in segregation displayed subtle neurological symptoms, or symptoms similar to attention deficit disorder combined with some other form of unknown vulnerability (p. 332). A growing number of prisoners who are labeled “disturbed/disruptive” come out of prisons with serious lasting mental health issues, difficulties socializing, and a often in a condition described as a “functional disability” after only being housed 3 months (Kupers, 2008, p. 1006).

After long-term confinement Haney (2003) described a psychological deterioration where they: “gradually change their patterns of thinking, acting, and feeling. . . these transformations have the potential to rigidify, to become deeply set ways of being, that are, in varying degrees for different people, more or less permanent changes in who these prisoners are and, once they are released from supermax, what they can become (p. 138)...many prisoners gradually lose the ability to initiate or to control their own behavior, or to organize their own lives...some of them lose their ability to set limits for themselves or to control their own behavior through internal mechanisms...they may begin to lose the ability to initiate behavior of any kind-to organize their own lives around activity and purpose...chronic apathy, lethargy, depression, and despair often

results...personal initiative erodes...Others find it difficult to focus their attention, to concentrate, or to organize activity” (p. 139). (Haney, 2003, p. 138-139).

The composite of symptoms deteriorate the individual and once released from prison contribute to difficulties succeeding in their reentry back into their communities.

### **Defining the Problem**

Those being released are not being properly diagnosed because of the unknown contribution of possible malingering, or difficulties deciding which symptoms or behaviors are a result of mental illness (Kupers, 2008,). Instead, prison mental health clinicians leave these individuals undiagnosed, and left to be labeled as “bad” or with a personality disorder (Kupers, 2008, p. 1010). The impact of purely being placed in a maximum security cell immediately classifies an individual as being difficult to manage, constantly fights, is defiant of authority, and difficult to handle (Bench & Allen, 2003).

It may have been easier to define prisoners who are already defined by corrections authorities as “the worst of the worst “ (Kupers, 2008) as being “nonresponsive” or “uncooperative” rather than to consider that social deprivation may be physically impacting the motor initiation parts of the brain, empathy, theory of mind, and creating symptoms similar to autism spectrum disorders (ASD).

Indeed the SHUs house many individuals who merit segregation for disciplinary or safety concerns to the prison. Despite this, consider a classic example of a correctional officer requesting a prisoner in the SHU to return his food tray through the door slot. Observing a hesitation in motor initiation or a subtly awkward gesture contrary to the requested behavior, the guards instinctively label this behavior as “resistance”. Consider an individual displaying an inappropriate emotional reaction, inappropriate language

communication, or uncontrollable repetitive behavior. If the origin of the behavior is better accounted for by symptoms of ASD that are out of the voluntary control of the individual, this has significant ramifications to standard incarceration procedure as well community re-entry protocol for successful reintegration. The possibility of prisoners having ASD or autistic symptoms may have been overlooked in past research or prison mental health screeners because some of the primary symptoms defining this condition have observers describing individuals as being “uncooperative”, “noncompliant” or “resistant”.

### **Purpose of the Study**

The purpose of this study is to add to the limited body of research focusing on the neuroplasticity of the brain to individuals who were previously housed in social isolation. The question being asked is what happens to individuals previously housed in social segregation when the recently discovered mirror neuronal system (MSN) that is responsible for learning language, empathy, understanding action, and motor skills by observing others (Gallese, Keysers, & Rizzolatti, 2004; Rizzolatti, 2005; Rizzolatti & Arbib, 1998; Rizzolatti & Craighero, 2004; Rizzolatti, Fadiga, Gallese, & Fogassi, 1996; Rizzolatti, Fogass, & Gallese, 2001; Werner, Cermak, & Aziz-Zadeh, 2012, p. 261) does not receive visual feedback from others? What happens to those regions of the brain and what type of symptoms would we expect to see? This study aimed to provide a quantitative analysis of the impact of social deprivation on the mirror neuronal system (MNS) in the left parietal lobe of the brain by measuring the deficits found in ASD that recent research has found to be associated with deficits in the MNS. Autistic symptoms were measured by comparing the scores on the brief Autism Spectrum Quotient (AQ-10)

to a group of men recently released from solitary confinement to those who were housed in general population or with another cell mate. The unique conglomeration of symptoms historically documented since the practice of social isolation in the prison systems (Grassian, 2006; Haney, 2003) appear to be analogous the classic symptoms found in an autism spectrum disorder.

This study highlights the possibility that the absence of social stimuli may possibly produce dormancy or inactivity in the mirror neuronal system in some of the formerly incarcerated individuals that have symptoms similar to the difficulties with cognitive ability, including imitation, language, theory of mind and empathy as seen in ASD and can be measured empirically using the simple Adult Autism Spectrum Quotient (AQ) brief version, the AQ-10 that measures the degree of traits associated with autism in an average adult (Allison Auyeung, & Baron-Cohen, 2012; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001; Woodbury-Smith, Robinson, Wheelwright, & Baron-Cohen, 2005). Parallel analysis of studies on Developmental Coordination Disorder, Romanian orphans and individuals with Autistic Spectrum Disorders who display similar symptoms and deficits of mental functioning, social relationships, communication with others, and initiation of physical movement, reveal deficits in the same regions in the brain (Hadjikhani, 2007; Kirby, Edwards, Sudgen, & Rosenblum, 2010; Morison, Ames, & Chisholm, 1995; Oberman, Hubbard, McCleery, Altschulaer, Ramachandran, & Pineda, 2005; Rutter, Anderson-Wood, Beckett, Bredenkamp, Castle, Groothues, Krepner, Keaveney, Lord, O'Connor, and the ERA Study Team, 1999; Werner et al., 2012).

**Research Questions and Hypotheses:**

1. Will having been housed in a social isolation cell in a prison or jail cell result in having higher scores for autism on the AQ-10 when compared to the scores of individuals formerly housed in general population or cell with another inmate?
2. Men formerly incarcerated in segregation will endorse more current autistic symptoms on the “True only now” column on the RAADS-14 when compared to those who were not housed in segregation.

**Hypotheses:**

H1: It was expected that formerly incarcerated individuals who experienced social isolation while in prison or jail will score higher above the cut-off (6 or above out of ten) on reported ASD symptoms as measured by the AQ-10 than individuals who did not experience social isolation, suggesting that social isolation either creates, facilitates or exacerbates ASD tendencies.

H2: Men having been segregated will endorse more current day autistic symptoms on the “True only now” column on the RAADS-14.

**Nature of the Study**

The present study utilized a multiple regression statistical approach to measure the impact of predictor variables on the dependent variable to measure the external validity of being able to make generalizations. The dependent variable in this study is the performance on the AQ-10 and the predictor variables were time in segregation, time out of segregation, and diagnoses of ADHD, Learning Disorder, Developmental Coordination Disorder, and Schizophrenia.



### **The Significance of the Study**

Research has shown that many individuals housed in isolation cells and released from prisons or jails have a unique conglomeration of symptoms that impact their welfare and their functioning that directly impacts recidivism rates. Accurately identifying their symptoms that develop due to the impact of social isolation on the mirror neuron system may assist community reentry service providers to better address and support their transition back into the communities. Due to limited information on the topic, they are often misdiagnosed with “PTSD” or just labeled by both prisons and communities as “violent” or “the worst of the worst.” It would be beneficial for the individual to obtain a more accurate diagnosis to improve their understanding and address recovery. The autistic like symptoms that may be appearing in these individuals are being distinguishingly classified in this study as “autistic” traits, or “pseudo-autism” to differentiate that this disorder qualifies for most of the symptoms outlined in the DSM-5 for autism spectrum disorders except “symptoms appearing in early childhood” (Solaris, 2015). Similarly, this hypothesis of this study is that the pseudo-autistic symptoms that develop, although debilitating may be reversible when addressed early and appropriately within community reentry service providers (Solaris, 2015).

The results may provide some understanding of how the specific symptoms may be happening due to current prison/jail social isolation standards and how the prison may begin to address the symptoms that develop with alternate modes of incarceration and future research to the length of time that exacerbates pseudo-autistic symptoms.

## Definitions of Terms

**Autism Spectrum Disorder (ASD):** According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), an autism spectrum disorder (ASD) is defined by:

Criteria A: Persistent deficits in social communication and interaction across multiple areas of life. The DSM-5 describes how the degree of severity is based on the impairments and restrictions to social communication and repetitive patterns of behaviors (p. 50). Criteria B: Restrictive patterns of behaviors, interests, or activities as seen in repetitive/stereotyped behaviors, routines, fixated interests, intense focus, or unusual interest in “sensory aspects of the environment”, including hyperactivity to sensory input (i.e., “apparent indifference to pain/temperature, adverse reactions to specific sound or textures, excessive smelling or touching of objects, visual fascination with lights or environment”) (American Psychological Association, 2013, p. 50). Criteria C: Reports a diagnosis must be made at an early developmental age but that symptoms may not be obvious until social demands “exceed limited capacities or may be masked by learned strategies in later life” (APA, 2013, p. 50). Criteria D: Symptoms cause significant impairment in many important areas of life (APA, 2013 p. 50-51).

Individuals with ASD are similarly identified by global impairments to communication and social functioning marked by rigidities in behavior (Bastiaansen, Thioux, Nanetti, van der Gaag, Ketelaars, Minderaa, and Keysers, 2011), deficits in language, theory of mind, imitation, empathy, (Oberman et al., 2005) and debilitating emotional impairments with unknown neural substrate origins possibly linked to the mirror neuronal system (Hadjikhani et al., 2006). Theory of mind is the proposal that an

individual can attribute and predict the beliefs and behaviors of others, a quality that has been considered to be missing in individuals with autism (Baron-Cohen, Leslie & Frith, 1985).

**Autism Spectrum Quotient – 10 (AQ-10):** (see Appendix F) The AQ-10 is the validated referral screening tool incorporating the ten most endorsed questions by autistic individuals found on the full scale Autism Spectrum Quotient (Allison et al. 2012).

**Brief Questionnaire** (see Appendix G): This is the title given to the fourteen questions of the Ritvo Autism and Asperger Diagnostic Scale Revised (RAADS-14) and the six additional questions directly asking participants if prior to being incarcerated in prison or jail if they have ever been diagnosed with Developmental Coordinating Disorder, autism, Asperger's, Schizophrenia, attention deficit hyperactivity disorder or a learning disorder to establish if there were pre-existing conditions.

**Direct Link to Formerly Incarcerated Individuals** (see Appendix I): The brief email and recruitment letter addressed directly to formerly incarcerated individuals and containing the hyperlink to the online survey.

**Former Incarcerated Individuals:** Males between the age of 18 through 85 who were incarcerated in a prison or jail cell.

**General Survey** (see Appendix F): For the purpose of this study, the AQ-10 was retitled the "General Survey" to prevent participants from guessing the purpose of the study and answering accordingly.

**Inclusion Questions** (see Appendix D): Seven inclusion questions were asked to exclude individuals who did not meet the criteria for the study.

**Instruction Form for Formerly Incarcerated Individuals** (see Appendix C):

The email containing the recruitment letter and hyperlink provided to reentry service providers to give to formerly incarcerated individuals to start the survey.

**Mirror Neuron System:** The collective regions in the premotor cortex, including the superior temporal sulcus, the superior parietal lobule, and the intra-parietal sulcus (Aziz-Zadeh & Ivry, 2009) that various studies have shown are activated in a normal brain when producing behavior or when observing another individual doing the behavior. The region has been connected to the cognitive abilities of imitation, empathy, language and theory of mind, which is a person's ability to take another's point of view (Carr, Iacoboni, Dubeau, Mazziotta, & Lenzi, 2003; Gallese & Goldman, 1998; Imuta, Henry, Slaughter, Selcuk, & Ruffman, 2016; Rizzolatti, 2005; Rizzolatti & Arbib, 1998; Rizzolatti, Fogassi, & Gallese, 2001). Studies on the MNS describe deficits with determining the mental states of others or mindreading (Gallese & Goldman, 1998), understanding, imitating or empathizing with others (Oberman et al., 2005; Wolf, Gales, Shane, & Shane, 2001), creating a cognitive communal connection with understanding others (Rizzolatti & Arbib, 1998) and difficulties with communicating, and social skills (Iacoboni, Woods, Brass, Bekkering, Mazziotta, & Rizzolatti, 1999).

**Pseudo-autism** was used in this study to define the condition possibly acquired when formerly incarcerated individuals in social isolation report present day symptoms found similar to an autism spectrum disorder in the DSM-5 but they did not have the symptoms present during an early developmental stage. These symptoms must not have been present prior to incarceration as participants self reported on the RAADS-14 "True now and when I was young column." In this study, the main hypothesis reports that

individuals who have been exposed to segregation will endorse symptoms on the AQ-10. Symptoms were similarly measured secondarily using the RAADS-14 “True only now” scale.

The pseudo-autistic condition may reflect the collective conglomeration of symptoms historically seen in men in isolation, including reports of difficulties initiating behavior (Haney, 2003), hyper-responsivity to stimuli, intense preoccupations, and perceptual distortions, compulsion to repeat behaviors, difficulties with impulse control, increased social impairments, such as increased social conflict, pronounced social withdrawal, a debilitating intolerance to socialize (Haney & Lynch, 1997, p. 506; Grassian, 2006, p. 335-337), impaired cognition, difficulties organizing their lives (Haney & Lynch, 1997) and emotional flatness, chronic apathy, and lethargy (Haney, 2003). Pseudo-autism will also be defined by associated features relevant to theory of mind, including feelings of unreality, a ‘mental fog’, loss of sense of self and/or identity (Haney, 2003; Grassian, 2006), as well as language difficulties, including symptoms of echolalia, and often repeating themselves (Solaris, 2015).

Pseudo-autism may also describe the impact of social segregation on the mirror neurons with formerly incarcerated individuals reported difficulties with social alienation, lack of empathy and social anxiety.

**Recruitment Email to re-entry service providers** (See Appendix A): The email initially sent out through the Internet to introduce the study and request re-entry service providers to assist in identifying potential participants.

**Re-entry Service Providers:** Re-entry service providers are community public officials or service providers (e.g., Parole Officers, mental health workers, substance

abuse counselors, addiction support groups, psychologists, employment/career counselors, lawyers, case managers, or spiritual clergy in a faith based service program) responsible for monitoring or supporting the transition of formerly incarcerated individuals back into society.

**Ritvo Autism and Asperger Diagnostic Scale-Revised (RAADS-14):** (see Appendix G) The RAADS-14 is a validated tool for screening for adults who may have an unrecognized autism spectrum disorders (Eriksson, Andersen, & Bejerot, 2013).

**Secure Housing Units (SHUs):** The official name of the isolation cells in the California Department of Corrections and Rehabilitation. Removed from general prison population and social activities, and placed alone in a small cell with minimum human interaction, and visual and acoustic isolation for an average of 22 to 23 hours daily (Amnesty International, 1980; Haney, 1997; Hresko, 2006).

**Segregation/solitary confinement/isolation cells:** All of these terms were used throughout the study interchangeably. For this study, segregation was defined using the standard definition of isolation accepted throughout many sources and defined by the Dr. Stuart Grassian study (2006) by being inside a cell alone for at least 22 to 23 hours a day, for about at least five days a week across a minimum of five months. This is often referred by incarcerated individuals as solitary confinement, administrative segregation, secure housing units, the SHU, the hole, a disciplinary unit, or other type of restrictive housing, “alone” in a cell. This type of housing is considered to them to be the opposite of being housed in general population housing, or “mainline” housing where an individual can visually see other inmates.

## **Chapter II. Literature Review**

The purpose of the present literature review is to evaluate past comprehensive studies that have been done on Romanian orphans who were isolated and correlate their autistic symptoms to past and present day men recently released from prisons and jails from social isolation cells. This study attempts to correlate the manifestations of autistic symptoms as due to the impact of social isolation putting dormant the recently discovered mirror neurons in these individuals recently released from prison and jail.

This study reviews research on children that have been socially isolated in Romanian orphanages and displayed autistic symptoms. These similar symptoms have historically been documented in men who have been housed in solitary confinement and this study will connect how inactivity in the mirror neuron system may be creating deficits as found in autism, or “pseudo-autism.”

“Pseudo-autism” describes the collection of unique symptoms that many prisoners manifest after being housed in segregation/solitary confinement/secure housing units since this practice began. The correlation of symptoms between individuals housed in the SHUs and individuals diagnosed with Autism Spectrum Disorders (ASD) can be measured by evaluating the impact of social deprivation on humans as studied in children raised in Romanian Orphanages in the late 1980’s. Studies on these orphans highlight the importance of mental functioning, social relationships, communication with others, and physical development that impact later adjustment in life (Morison et al., 1995; O’Connor, Rutter, Beckett, Keaveney, Kreppner and the English, and Romanian Adoptees Study Team, 2000: Rutter, Anderson-Wood, Beckett, Bredenkamp, Castle, Groothues, Kreppner, Keaveney, Lord, O’Connor, and the ERA Study Team, 1999).

Morison et al. (1995) identified factors that play important roles in a child's development such as the availability of stimulating material, and the opportunity to learn through environmental exploration. The outcome of an adoption also played a role in their future success (Morison et al., 1995).

### **Autistic Symptoms Develop in the Romanian Orphans**

The Ceausescu Regime in Romania established the "cradle system" to care for and house poor infants and children, which resulted in 100,000 children being warehoused in colorless and quiet rooms with little visual/audio stimulation (Morison et al., 1995, p. 413). The children's basic needs were barely met and they had very limited human contact and social interactions (Kaler & Freeman, 1994, p. 769).

When Romanian orphans were first found, most children were typically unresponsive, and many exhibited global delays in all areas of development, including cognitive, adaptive, personal-social, language, fine and gross motor skills (Morison, et al., 1995) and deficits in social functioning (Kaler & Freeman, 1994).

The children showed mental functioning in the [retarded] range, "they remained in cots all day", they had "little if few toys or playthings, were fed gruel through bottles with large teats often left propped up for self-feeding", were given "no personalized caregiving and very little talk or interaction with caregivers" (Rutter et al., 1999, p. 538). Social stimulation and social interaction were powerful influences in an individual's development (Morison et al, 1995; Vygotsky, 1978). Morison et al. (1995) emphasized Bowlby's (1953) attachment theory regarding the human necessity for "warm, intimate, and continuous relationships" with significant social figures critical for healthy development (Morison et al, 1995, p. 412). Bowlby (1946) also suggested these children



developed an “affectionless psychopathy” – a “pattern of failure to form intimate committed relationships associated with antisocial behavior” (Rutter, 1981; Rutter et al., 1999, p. 537).

In a study of 111 Romanian orphans, 5% of the children displayed ordinary autistic like patterns of behavior and 6% showed milder autistic features (Rutter et al. 1999). Children exhibiting autistic characteristics had longer durations of social/psychological deprivation and displayed greater cognitive impairment than those without autistic characteristics (Rutter et al., 1999, p. 537). The eleven children who displayed autistic features displayed social relationships difficulties, problems communicating with others, difficulties forming friendships, and a lack of socially appropriate reciprocal empathic behaviors such as eye-to-eye gazing and social gestures (Rutter et al., 1999, p. 539). Seven of the children became intently preoccupied with touching specific objects repetitively or smelling objects (Rutter et al., 1999, p. 539).

Rutter et al., (1999) found that seven of the eleven children displayed “quasi-autistic” symptoms of autism and three of the eleven children with autistic symptoms displayed severe cognitive impairments, including severely developmental delayed scores on the ADI-R (Autism Diagnostic interview-Revised) and a firm diagnosis of autism (Rutter et al., 1999, p. 539). Rutter et al. (1999) found that “severe sensory deprivation in early life can impede normal brain development and developmental programming for aspects of psychological functioning relevant to the genesis of autism” (Rutter et al., 1999, p. 544).

### **Autistic Symptoms Historically Found in Men Housed in Solitary Confinement for Small Durations of Time**

Autism Spectrum Disorders (APA, 2013) include features such as deficits in social communication, repetitive/stereotyped behaviors, fixated interests, hypersensitivity to sensory input, unusual sensory aspects, and significant impairments in many areas of life (APA, 2013, p. 50-51). Seven of the Romanian children in one study became intently preoccupied with sensations of touching specific objects repetitively or smelling objects (Rutter et al., 1999, p. 539). Men housed in solitary confinement displayed a specific psychiatric syndrome that included hyper-responsivity to any environmental stimuli, or an “overload” and being intolerably sensitive to every day items like the sounds of the plumbing or typical noises coming from the adjacent cells (Grassian, 2006, p. 335, Haney & Lynch, 1997). Haney & Lynch (1997) described how prisoners experienced something described as sensory overload where those housed in small confinement could not escape the subtle presence of others or even the slightest noise (p. 497). The men in isolation became obsessed and preoccupied with thoughts, small environmental stimuli, or some perceived slight that would irritate them and amplify their anger, agitation, and paranoia, (Grassian, 2006, p. 332). Similar symptoms are found in autism, as well as associated features found in both orphans and men in isolation.

Beyond the DSM-5 (2013) main criteria for a diagnosis of autism, associate features include self-injurious behaviors, delays in motor behavior, problems with anxiety and depression (American Psychiatric Association, 2013). Formerly incarcerated individuals have historically displayed self-injurious behaviors, such as head banging, cutting or other self-mutilating behaviors; (Grassian, 2006; Haney, 2003; Haney &

Lynch, 1997) and are well documented for difficulties with clumsiness and motor delays as seen frequently in being penalized for minor infractions such as hesitations in returning food trays (APA, 2013; Arrigo & Bullock, 2008; *Madrid v. Gomez*, 1995).

Individuals with autism have also been described as rarely imitating others actions, having difficulties taking other's perspectives, displaying communication difficulties, displaying deficits in empathy, and a lack of theory of mind (Oberman & Ramachandran, 2007). Men in segregation have often appeared increasingly uncomfortable interacting with others, anxious, and alienated (Haney, 2003, p. 140). As a result of social isolation, these prisoners became distracted, unable to concentrate, and experienced "a kind of dissociative stupor – a mental "fog" in which the individual [couldn't] focus attention . . . or grasp or recall when he attempts to read or to think" (Grassian, 2006, p. 331). When men in isolation were directly released into the community they displayed clinically significant impairments in all areas of life, including social and occupational impairments (Grassian, 2006; Haney, 2003; Kupers, 2008) as similarly outlined by autism criteria (APA, 2013). Combined with social alienation and isolation, they experienced a slow deterioration of their thinking and personality (Haney, 2003, p. 138-139), and retreated "more deeply into themselves," and became disoriented and frightened by social interactions (p. 140).

Other associated symptoms of autism, such as difficulties controlling impulsivity, irritable, self-injury, heightened anxiety, elevated aggression, hyperactivity, restlessness and other maladaptive behavior (West, Waldrop, & Brunssen, 2009) have also been documented in men housed in social isolation (Grassian, 2006; Haney & Lynch, 1997; Kupers, 2008). Multiple sources also show that their symptoms when they are released

contribute to difficulties with self-regulation and amplify socially maladaptive behaviors (Kupers, 2008; Ashker v. Brown, 2015).

### **Correlating Social Isolation to the Mirror Neuron System**

Observed deficits in prisoners housed in the SHUs may be the same as or similar to those found in autism originating in the mirror neuron system (MNS) (Bastiaansen, et al., 2011; Dapretto, Davies, Pfeifer, Scott, Sigman, Bookheimer, & Iacoboni, 2006; Oberman et al., 2005). Recent research of the mirror neurons in the human brain may help decipher the unique conglomeration of deficits and symptoms seen in prisoners housed in the SHUs, specifically symptoms that parallel deficits to the MNS located in the parietal-frontal cortical circuit responsible for helping individuals understand movement, empathy, language, and social interaction (Oberman et al., 2005; Rizzolatti, 2005; Rizzolatti & Sinigaglia, 2010). Alongside this study, Gallagher (2014) also introduced the phenomenology of social deprivation inducing autism, a similar argument of inactivity in the mirror neuron system as seen in Romanian orphans and men in isolation. This study proposes that the similar autistic deficits observed in prisoners housed in isolation are a result of the impact of inactivity in the mirror neuron system.

The MNS controls four areas of cognitive ability: imitation, empathy, language, and theory of mind (Carr et al., 2003; Gallese & Goldman, 1998; Rizzolatti & Arbib, 1998; Rizzolatti, 2005; Rizzolatti, Fogassi, & Gallese, 2001). Individuals with ASD have impairments in all four of these areas of functioning (Bastiaansen, et al., 2001; Dinstein, Thomas, Humphreys, Minshew, Behrmann, & Heeger, 2010; Egorova, Pulvermuller, & Shtyrov, 2013; Oberman, et al., 2005). As previously mentioned, prisoners housed in the SHUs exhibit symptoms of impairment in all four areas empathy, maladaptive social

behavior and anxiety, and other neurological symptoms (Grassian, 2006; Haney, 2003; Kupers, 2008) that appear to resemble autistic symptoms.

The mirror neurons are given their name because they are activated in the brain when an individual executes an action after watching somebody else perform that action (Goolkasian, 2009, Rizzolatti & Craighero, 2004; Rizzolatti, Fadiga, Gallese, & Fogassi, 1996; Rizzolatti & Sinigaglia, 2010). These neurons are fired during both the watching and the performing of a motor activity, and although motor and sensory pathways are separate, there may be evidence of perception and action having shared neuronal substrates (Fadiga, Fogassi, Pavesi, & Rizzolatti, 1995; Ferrari, P., Bonini, L., & Fogassi, L., 2009; Iacoboni, 2010; Rizzolatti et al., 1996). Rizzolatti & Sinigaglia (2010) described a “mirror mechanism” in humans where every time one individual observed another’s behaviors or actions, the observer’s specific neurons that mentally programmed and encoded the information were similarly activated in their mirror neuron region (p. 264).

Originally found in the F5 region of the macaque monkeys’ premotor cortex, humans have a parallel motor system that is devoted to carrying out movements and involved in the recognition of those movements (Fadiga et al., 1995; Rizzolatti, Fadiga, Gallese, & Fogassi, 1996; Rizzolatti, 2005; Keysers & Perrett, 2004). Monkeys’ mirror neural activity is part of an execution “matching system” that may allow them to perform both the overt automatic execution of specific actions or an internal simulation and representation of the observed behavior (Gallese & Goldman, 1998; Oberman et al., 2005, p. 191).

Fadiga et al. (1995) described the observation/execution matching system in monkeys also found in humans that when observing others provokes a similar “pattern of muscle activation evoked by transcranial magnetic stimulation (TMS)” (Fadiga, Fogassi, Pavesi, and Rizzolatti, 1995, p. 2609). Recent neurophysiological studies and brain imaging have shown that evidence that the MNS is located in the frontal and parietal regions of the human brain (Gazzola & Keysers, 2009; Iacoboni et al., 1999; Werner et al., 2012). More recent studies have also located MNS clusters in the cerebellum, the primary visual cortex, and parts of the limbic system responsible for “auditory, somatosensory and affective components” (Molenberghs, Cunnington, & Mattingley, 2012, p. 341).

Rizzolatti (2005) initially suggested that the primitive brain had a built in mechanism that was capable of “mapping pictorial accounts of actions” by connections to corresponding visual and motor areas of the brain, including the parietal premotor mirror circuit (p. 419). Merely looking at objects is inadequate for understanding and initiating movement, instead individuals have to process the information through an inherent semantic component which gives the observed behavior, and the imitation and performance of that behavior, meaning (Rizzolatti, 2005, p. 419).

For example, recognizing facial expressions activate the mirror neuron system and is necessary for understanding the observed expression in terms of our own specific mental representations (Oberman et al., 2005). Observing others actions provides a common bond and “an understanding of the action” modeling the appropriate response for empathy and needed to perform the action (Rizzolatti & Arbib, 1998, p. 188; Wolf, Gales, Shane & Shane, 2001). Individuals learn to understand others’ actions and connect

that understanding to self-produced actions. (Keysers & Perrett, 2004). The dominant theory today of the function of the MNS is based on a person's capacity to map observed actions onto one's own motor system suggesting the role of understanding and later initiating action (Rizzolatti & Sinigaglia, 2010) deficits possibly found in autism (Hamilton, 2013).

This study suggests that the unique autistic symptoms exhibited in the men who have recently been housed in segregation cells across the U.S. and the children in Romanian orphanages are a result of not being exposed to learning through watching others and may be attributed to deficits in the MNS.

### **The Mirror Neuron System and Autism**

The cause of deficits to the social mind, including the poor communication and social skills found in autism and the role of the mirror neuron system continue to be debated (Hamilton, 2013; Marsh & F. de C. Hamilton, 2011; Oberman, McCleery, Hubbard, Bernier, Wiersema, Raymaekers, & Pineda, 2013; Oberman & Ramachandran, 2007).

The "Broken mirror theory" of autism proposes that individuals with autism have a dysfunctional MNS as seen through their symptoms of social deficits in empathy, theory of mind, imitation, and language (Dapretto et al., 2006, p. 1; Oberman et al. 2005; Oberman et al., 2007; Oberman & Ramachandran, 2007; Ramachandran & Oberman, 2006). EEG Mu wave oscillation frequencies (8-13 Hz) over the sensorimotor cortex have been found to be associated with activity in the mirror neuron system and have been used to measure responsiveness to observed and actual movement as well as understanding and imitating behaviors of other people (Oberman et al. 2005, p. 190).

Oberman et al. (2005) found that when compared to a control group that displayed significant Mu suppression in both self and observed hand movements, ten ASD individuals displayed significant Mu wave suppression in self-movements but not in observed movements (Oberman et al. 2005, p. 191). Together with behavioral deficits seen in individuals with autism, this suggested that the dysfunctional mirror neuron system might be responsible for high functioning individuals with ASD (Oberman et al, 2005).

More recent studies have found that when compared to a control group, autistic individuals “failed to imitate the observed actions while their mu suppression indicating MNS activity was intact” challenging the “Broken Theory of Autism”, and instead suggesting that the mirror neuron system works to some functioning extent (Dinstein et al., 2010; Fan, Decety, Yang, Liu, and Cheng, 2010). “Less mu suppression to action observation coupled with more communication severity may suggest that the MNS activity can reflect the symptom heterogeneity of ASD” (Fan et al. 2010, p. 986). Other studies suggest that there is an augmentation of the MNS or improvements in social functioning and gazing behaviors (Bastiaansen et al. 2011). Oberman et al., (2013) used a sample of 66 individuals with autism and compared them to 55 typical subjects and found that the dysfunction of the MNS progresses and changes across ages with an MNS normalizing across time in autistic individuals (p. 303).

Studies on the functions and deficits of the mirror neuron system which detail difficulties with determining the mental states of others or mindreading (Gallese & Goldman, 1998); understanding, imitating or empathizing with others (Theory of Mind) (Oberman et al., 2005; Wolf, Gales, Shane, & Shane, 2001), communicating, and social



skills (Iacoboni, et al., 1999), creating a cognitive communal connection with understanding others (Rizzolatti & Arbib, 1998) and similar MNS deficits were communicated and measured by men housed in segregation during this study.

### **Chapter III. Methodology**

The hypothesis of this study stated that a survey sample of formerly incarcerated individuals who were held in segregation cells in prisons or jails would display higher frequencies of scores above the standard cut-off score (Baron-Cohen et al., 2001) on the Brief Adult Autism-Spectrum Quotient (AQ-10) (Allison, Auyeung et al., 2012) when compared to the AQ-10 scores of a sample of prisoners who were previously housed in general population cells. The independent variable in this study is a positive red-flag screening for an Autism Spectrum disorder. The dependent variable was higher scores on the AQ-10 confirming a potential red flag diagnosis of Autism.

A power analysis showed that for a multiple regression with an alpha level of .05, a medium effect size for distinguishing a significant difference between a group of individuals possibly diagnosed with an autism spectrum disorder or not, a minimum sample of 100 was obtained to achieve a power of .80. This will make it possible to detect that the symptoms often found in an autism spectrum disorder may be a result of being housed in social isolation. To prevent getting spoiled data and limiting the statistical power, an oversampling of 300 participants were reached and a sufficient sample was obtained (N = 96) from Qualtrics, an Internet survey application. The Alliant International University's Institutional Review Board (IRB) approved this study..

#### **Participants**

Participants for this study were adult males who could read and understand basic English and were housed in the isolation cells and in general population cells in the prisons and jails within the U.S. The majority of these individuals were found through reentry service providers. Re-entry service providers are community public officials or

service providers (e.g., parole officers, mental health workers, substance abuse counselors, addiction support groups, psychologists, employment/career counselors, lawyers, case managers, or spiritual clergy in a faith based service program) responsible for monitoring or supporting the transition of formerly incarcerated individuals back into society. Several search techniques were implemented to seek out email addresses of community re-entry service providers (See Appendix O).

To participate in this study, it was necessary for each participant to have access to the Internet or working collaboratively with a reentry service provider who received a recruitment letter and could also request a postal mail version if needed. A postal version of the study was made available at their request three weeks into data collection after several reentry service providers reported that their clients were not allowed access to computers as a condition of their parole. An announcement was made on both the recruitment email for reentry service providers and on the direct link email to formerly incarcerated individuals stating to contact me if they preferred a postal mail format of the survey. About 80-100 surveys were sent out to individuals and reentry service providers by postal mail containing the same documentation and a return envelope (see Appendices J through N).

This study sent out the full recruitment email (see Appendix A for more details) or the brief recruitment email (see Appendix B) to reentry service providers found on the Internet through prison reentry resource lists and general websites voluntarily recruiting formerly incarcerated individuals through the Internet and social media. In reaching out to providers, many also provided referral email addressed to other locations and service providers that offered reentry services and emails were also sent.

The service providers recruitment email provided a link directly to the Qualtrics website. Another second recruitment email directly addressed to the formerly incarcerated individuals (see Appendix I for more details) and similar to the reentry service providers recruitment letter was sent out on emails and posted on websites specializing in audiences consisting of primarily formerly incarcerated individuals. Both recruitment emails connected participants to the webpage containing the “Information form for Formerly Incarcerated Individuals” (see Appendix C for more details).

Both paths entered through the Qualtrics study link and each subject reached an initial “Information for Formerly Incarcerated Individuals” (see Appendix C) and the informed consent titled the “Participant’s Agreement Form” (see Appendix E). Prior to the informed consent that explained that participation was voluntary, subjects were redirected through seven inclusion questions. The formerly incarcerated individual was required to sign the designated informed consent. The informed consent specifically highlighted that participation was voluntary. The recruitment letter and the informed consent both reiterated that all the data they provided would be encrypted and “coded” to protect their anonymity. Any questions that were asked were responded to immediately by way of email as well as by phone if requested.

### **Inclusion Questions**

The purpose of this dissertation was to gather the email and postal survey responses of the AQ-10 questionnaire from a sufficient sample of individuals who were housed in the isolation cells of prisons and jails, and compare them to the questionnaire responses of a significant sized sample of men who were housed in general population cells or with another cell mate and never housed in segregation. The seven initial

inclusion questions included males only, over the age of 18 when last released from incarceration, currently between the age of 18 and 85 years old, that they were housed inside the prison/jail for a minimum of five months, and based on what type of cell they were in, isolation cell or general population cell, how long they were in that cell and when they were released.

In the initial collection of the data the assumption was made that men would fall into two categories, men held in segregation units versus men held in general population. After two weeks of collection it appeared that most men had experienced being housed in both types of cells, reporting both conditions to varying degrees of time. The first twenty participants who attempted to complete the questions were not offered clarifying questions of ever having been housed in segregation less than five months so their surveys were not included in the study. Additional questions had to be asked to help distinguish the varying amounts of time in segregation. The additional questions appear in the final version of the Inclusion Questions (see Appendix D). Men who endorsed having been in general population cells were also asked if they had ever been housed in a segregation cell and for how long. This was reiterated in both questions (3) and (5). For this study, being housed in an isolation cell was defined as being in a cell alone most of the time for at least 22-23 hours a day across at least five days out of the week minimum. Men who endorsed having been in general population cells were also asked if they had been housed in isolation cells and if so for how long. The questions determined the amount of time incarcerated, whether they were housed in segregation, and how much time since being incarcerated in segregation. Their response to these questions determined what group they were included in, the social isolation group or the

comparison group with individuals who were housed in a general population/other cellmate group.

### **Measuring for Autistic Symptoms with the AQ-10**

The unique advantage of this particular study is the low face validity of both of the measures, the AQ-10 and that RAADS-14 once the titles were removed. Subjects could not guess what the test was measuring or could not attempt to alter the results by deliberate malingering or demand characteristics. For this study, the AQ-10 was labeled the “General Survey” and the RAADS-14 was labeled the “Brief Questionnaire.” Low face-validity increased the likelihood that participant’s motivation or test-taking strategies before and during testing did not interfere with the results (Bornstein, 1996, p. 983). Similarly, this study did not highlight any psychiatric symptoms or require subjects to reveal any type of personal deficits past studies have incorporated in attempting to measure as a result of the impact of solitary confinement on the individual. Historically out of personal safety needed to survive dangerous prison conditions, these individuals learned to hide any perception of weakness or expression of emotions or deficits (Haney, 1997). They often appear defensive discussing psychiatric difficulties and often rationalize, deny or distort symptoms and minimize the impact of isolation (Grassian, 2006, p. 334).

Another advantage of utilizing the AQ-10, which was derived from the full scale AQ is that the items on both the measures were randomized (half “disagree” and half “agree”) to prevent response bias (Baron-Cohen et al., 2001). This feature of the AQ-10 contributed to lowering demand characteristics, strategic responding or malingering often attempted by previously incarcerated individuals.

**Autism Spectrum Quotient (AQ-10)**

The brief Autism Spectrum Quotient (AQ-10) was comprised out of the ten most endorsed questions in the Adult Autism Spectrum Quotient (AQ). The AQ is a screening instrument and questionnaire created by Baron-Cohen and colleagues (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). Used as a referral tool, it has a cut off score of 26+, where autistic patients were correctly identified 83% of the time (specificity of 0.52, sensitivity of 0.95) while a cut off score of 32+ identified 76% of autistic patients correctly (specificity of 0.74 and sensitivity of 0.77) (Baron-Cohen et al., 2001; Ruzich, Allison, Smith, Watson, Auyeung, Ring & Baron-Cohen, 2016, p. 2). The AQ is a brief, self-administered instrument from the United Kingdom that was originally created to quantitatively measure the degree that individuals with normal intelligence possessed traits associated with an autism spectrum diagnosis or the core features of an autistic phenotype (Baron-Cohen et al., 2001). It was created to diagnose the five domains of autism or 'autistic traits': attention to detail, attention switching, imagination, communication, and social skills in adults based on the DSM-IV criteria (Baron-Cohen, et al. 2001).

The AQ was tested for simple understanding and comprehension on a pilot sample in the United Kingdom and was found to be valid for normal IQ individuals who could read and discuss basic issues, including individuals who could judge their preferences, whether easy or difficult (Baron-Cohen et al., 2001). The AQ has been validated for use in person, through postal mail, and on-line via email (Baron-Cohen et al., 2001). The tool has been found to have good discriminative validity and adult screening capacities (Allison et al., 2012; Woodbury-Smith et al., 2005). With a cut off

score of 26, it had an 83% specificity and sensitivity of individuals who were later classified correctly with autism (Woodbury-Smith et al., 2005). Individuals with diagnosed ASD scored significantly higher than those individuals from the general public (Baron-Cohen et al., 2001; Allison et al., 2012).

The AQ has also been validated across cultures (Hoekstra, Bartels, Cath, & Boomsma, 2008; Wakabayashi, Baron-Cohen, Wheelwright, & Tojo, 2006). Response options on each item of the AQ range from ‘definitely disagree’ to ‘definitely agree’ where nearly half of the questions receive a point for answering ‘definitely disagree’ and the other half receive a point for answering ‘definitely agree’ (Baron-Cohen et al., 2001). The AQ was validated to be used as a “red flag” instrument (Allison, et al. 2012), a high score alone does not merit a diagnosis of autism; instead in addition to this the individual must be suffering from a clinical level of distress because of these traits interfering with their lives (Baron-Cohen et al., 2001; DSM-IV, 1994).

From the full length AQ, several studies have narrowed down the most discriminating items and created the abridged version, the AQ-10 (Allison et al., 2012; Booth et al., 2013; Hoekstra et al., 2011). The authors found that the short version, the AQ-10 had a high internal consistency of  $> 0.85$  and was equivalent when compared to the full scale AQ (Allison et al., 2012, p. 202; Booth et al., 2013). With an established cut-off of 6+ on the AQ-10, it has the capacity to distinguish between those individuals with or without an ASD clinical diagnosis (Booth et al. 2013, p. 2999).

For the purposes of this study, The “General Survey” (AQ-10) used the instructions on the full scale AQ, which read as follows:



*“Below are a list of statements. Please read each statement very carefully and rate how strongly you agree or disagree with it by circling your answer.”*

*(Baron-Cohen, Wheelwright & Skinner, 2001).*

Similar to the instructions on the AQ, the AQ-10 (General Survey), subjects had four options for answering the questions: “strongly agree, slightly agree, slightly disagree, and strongly disagree” (Allison et al. 2012, p. 204; Baron-Cohen et al., 2001). The AQ-10 has also been implemented and validated through Internet format and a postal version (Allison et al., 2012; Hoekstra et al., 2011) .

After the ten questions in the AQ-10, subjects were provided with new instructions on the RAADS-14 which for the purpose of preventing priming and guessing of the intent of the test, was renamed the “Brief Questionnaire” which asked fourteen initial questions from the RAADS-14 and five additional questions to determine if subjects had pre-existing symptoms of an autism spectrum disorder (ASD) and other diagnoses prior to being incarcerated.

#### **Ritvo Autism and Asperger Diagnostic Scale-Revised (RAADS-14)**

The RAADS-14 is a validated tool for screening for adults who may have an unrecognized autism spectrum disorders (Eriksson, Andersen, & Bejerot, 2013). Labeled here the “Brief Questionnaire,” it was completed by subjects at the end of the survey was used both to establish pre-existing self-reported autistic symptoms prior to incarceration and present day autistic symptoms. Having good construct and convergence validity, the reliability of the RAADS-14 screen also “showed excellent internal consistency (n = 1, 233, alpha = 0.9) for the full-scale” (Eriksson et al., 2012, p. 6).

For the purpose of this study, pre-existing and undiagnosed cases of autism were identified incorporating the RAADS-14 (See Appendix G), which was created to identify adults who have undiagnosed autism spectrum disorder (Eriksson, Andersen & Bejerot, 2013). The RAADS-14 was used to assist in distinguishing between autistic symptoms they experienced when they were young and autistic symptoms that may have developed recently (“True only now”), possibly after their incarceration. The response alternatives for the RAADS-14 incorporated a four-point Likert scale ranging from 3 to 0 indicative of the duration in which the individual reported having the symptoms (3 equating a response of symptoms being ‘True now and when I was young’ (TNWY), 2 being ‘True only now’ (TON), 1 being ‘True only when I was younger than 16’ (TN16) and 0 representing ‘Never true’ (NT)) (Eriksson et al., 2013, p. 3). The scoring system on number 6 is reversed (0 to 3) where a “True now and when I was young” response merits a 0 point score and a “Never true” response accruing 3 points (Eriksson et al., 2013).

The RAADS-14 study (2013) established a cut off score of 22, which yielded a “reasonable” sensitivity and specificity of 81% for identifying individuals with autism spectrum disorders (Eriksson et al., 2013). This cut off score affirmed subjects who both endorsed responses suggestive of “True now and when I was young” and “True only now” due to the accumulation of points surpassing the minimum cut off. This cut-off does not distinguish between those individuals who were born with autism spectrum disorders or not, instead classifying all individuals who display any type of ASD symptoms. The RAADS-14 was not built to distinguish perfectly between ASD and non-ASD group and the original study only the total RAADS-14 score was significantly

higher ( $p < 0.001$ ) in the ASD group than the other groups (median ASD: 32; ADHD: 15; other psychiatric disorders: 11) (Eriksson et al., 2013).

According to the DSM-5 (APA, 2013) diagnosis for autism spectrum disorders, an individual obtains a diagnosis if symptoms have been present when they were young. After consulting with the creator of the RAADS-14 and for the purpose of this study, the RAADS-14 was utilized to rule out pre-existing cases of autism by identifying individuals who had already exhibited autistic symptoms prior to being incarcerated. In the Eriksson et al. study (2013) the author reported that very few participants who scored the 23 or above cut off (5 out of 106 did not) endorsed at least 6 items in the “True now and when I was young” column (Eriksson, 2016). With a specificity of 75% and sensitivity of 65-80%, he recommended establishing a cut off of endorsing 6 items in the column “True now and when I was young” suggestive of childhood autism (J. Eriksson, personal communication, Dec. 11, 2015). For this study, if an individual endorsed 6+ items on the RAADS-14 “True now and when I was young” column, they were defined as having symptoms of autism since childhood or ASD. In the survey, participants were given each one point for responding to the “True now and when I was young” column (for number 6., the opposite response “Never true” was also given one point) and if they endorsed 6+ (the cut off) suggesting early life autistic symptoms, they were automatically excluded from the study.

After the initial fourteen questions that were part of the RAADS-14, subjects were asked six additional questions excluding those who reported preexisting diagnoses of Development Coordination Disorder, Autism, Asperger’s, Schizophrenia, Learning Disorder or ADHD. As described above, individuals with impairments to the MNS as

hypothesized in Developmental Coordinating Disorder (Werner et al., 2012) could not be used for this study. Individuals with Schizophrenia who display similar symptoms of impaired social communication and personality traits as autism and increase the possibilities of a false positive were also excluded from the study (Woodbury-Smith et al., 2005). Three participants reported having schizophrenia and were removed from the study.

All subjects were additionally asked in the inclusion questions regarding clinical distress to assess if they experienced difficulties in their life because of symptoms that have developed since being in prison/jail (getting housing, getting a job, substance use, etc.). Subjects were not excluded based on how they responded to this question and as a result this question was placed at the very end of the Brief Questionnaire. Historically, when men who were housed in isolation cells were asked how they were doing, they tended to minimize their symptoms (Grassian, 2006), whereas those men housed in general population cells and forensic settings have had many incentives to fake bad and malingering (Edens et al., 2007). This additional question was used to obtain additional information regarding clinical distress. Because most of these men were reached by way of reentry service providers, this provided information that they were experiencing difficulties in life and fulfilled the criteria of experiencing clinical distress. Similarly, during the recruitment of most men from the Internet, when reaching out by phone to answer their questions, each verbally endorsed difficulties and negative consequences from having been incarcerated in segregation.

## **Chapter IV. Results**

### **Collection of Data**

Data collection occurred across 2.5 months, from June 17, 2016 to September 30, 2016. This study considered potential responses contaminated by malingering and biased responding. Throughout the first two months of data collection the study included the feature of “Ballot Box Stuffing” to prevent people from taking the survey more than once. During the third month this feature was removed after several reentry service providers reported that several individuals were going to participate in the survey by using the same computer.

Although the original definition of this study identified being segregated as being inside a cell alone for at least 22 to 23 hours a day, for about at least five days a week (Grassian, 2006) across a minimum of five months, many participants reported having been held in isolation for lesser amounts of time than five months. Initially the study established two comparison groups, one held in isolation and one for those held in general population. After a week of recruiting it most men reported that they were held in smaller amounts of time in isolation. Several questions were added to clarify if participants had experienced any amount of time in segregation (see Appendix D). This was considered after past studies have shown that men housed in segregation show symptoms after being housed less than a few days (Grassian, 1986). Initially only utilizing the Recruitment letter to Re-entry Service Providers (see Appendix A), a second recruitment letter addressed to participants “Direct Link for Internet Websites” (see Appendix I) and a third letter were posted on the internet “Direct Link for General

Population” (see Appendix N). The third letter was posted specifically to increase the number of participants housed in general population only.

Changes to the recruitment letter language had to be made after several RSPs reported that many formerly incarcerated individuals preferred not answering questions about their past that “upset them.” On the recruitment letters participants were informed that instead of being asked questions about their “past experiences,” they were going to respond to questions about their “personal preferences.”

An error was made on the part of the researcher with utilizing the Qualtrics system “skip logic,” in particular to men who displayed pre-existing conditions of autism (scoring 6 or more on the TNWY column). Qualtrics’ “skip logic” was utilized to conditionally assign participants to skip to the end of the survey if they responded the following way. If individuals endorsed more than six items in the “True now and when I was young” columns suggesting an early life autism diagnosis, the skip logic automatically directed them to the end of the survey circumventing the remaining questions. This feature was removed in the third month to allow the full data collection. The data from the first three months was still included in this study.

### **Converting the Data**

During the data collection, several men requested speaking over the phone for details and instructions regarding the study. All of the participants were given the same information regarding the length of time, examples of questions, and the study being voluntary and confidential. Participants completed the survey over the phone (N = 2), over the Internet (N = 64), in person (N = 4) and by postal mail (N = 26). Two hundred ninety-five individuals attempted to complete the online version and 98 completed the

full survey. Due to missing data, the regressions included a total of  $N = 60$ . The Mann-Whitney test utilized a total of  $N = 98$ .

The calculation of time inside segregation was established by the participant's multiple responses to the Inclusion questions (see Appendix D). The responses to these questions contributed to the information to calculate time in segregation and time out since. In interpreting and organizing the data for SPSS, special considerations had to be made in converting time in and out of segregation into months. One month was calculated using a 28-day calendar. Several of the participants provided alternate responses or missing responses that needed to be adjusted prior to submission into the statistical evaluation. Because most men endorsed the question regarding time out of incarceration as being "more" or "less than nine months" out with "Yes" or "No" responses (see Appendix D, question 3), their responses had to be converted into months in/out from incarceration. A logical conclusion was made by taking the average amount of time out from the already existing respondents who provided write in answers and came up with a replacement value of 6.2 months for 34 cases. For those participants who responded "Yes" to the question, "Were you in prison or jail within the last 9 months, they were assigned 6.2 months. Those individuals who responded "No" to not having been released within 9 months, 15 cases were replaced with the average of 10.1 months. Because the recruitment emails (Appendix A, I, and N) and the Information Email (Appendix C) specified that this study was specifically for formerly incarcerated individuals, a "No" response for question number three (Inclusion questions Appendix D) was considered as having been released from incarceration longer than 9 months. Fill in responses to other questions also verified that they had been incarcerated.

Fifteen of the participants did not include the specific amount of time out since being held in segregation so their reported time out since incarceration was used for this replacement value (question (3) of the Inclusion questions). When asked the question after being housed in general population, eight participants responded with “yes”, they were additionally asked, “how long were you in that type of cell and how long have you been out?” Five individuals provided only one response to the two-part question. The response chosen was based on their responses to other answers provided.

Two participants reported their time out of incarceration in regards to time off of probation rather than time out of incarceration. However, they did give the length of time in incarceration (32 years, 38 years) and the date they completed parole (2012, 2016). After consultation with probation officers regarding the relationship between time in prison and time on probation, an estimated time following incarceration of 100 months was assigned for both participants.

One individual’s response to time held in isolation was written as a “couple years” and this was converted to “24 months.” Individuals identified being held in segregation as “2 man cells,” “mainline,” “two man isolation,” “double occupancy” or “2 man isolation” where assigned “0 months” in segregation. One participant when asked if having been housed in isolation reported that he did “cell life.” This was considered segregation based on the location of the information he provided on the postal written version under being given the operational definition of isolation on number (5). (see Appendix D Inclusion questions).

Most men reported time in segregation in regards to a “year” or years and not a specific date. If they provided a year in segregation (e.g., 2008) this was converted to 12



months. The same was considered if they wrote having been in isolation for a year span (e.g., held in isolation from 2005-2016 = 12 months). One participant's response to time in segregation was a detailed account of several experiences in segregation, with one of his longest time reported as "6+ month," thus this was converted into 8 months. Two individuals responded to C. "Other" in question number (5) of the Inclusion questions without writing the type of housing, thus were considered for 0 months in segregation cell.

One participant only reported his time in segregation, as "the longest isolation was 11 months." This response was kept in the final data and all other times were not considered. Similarly, four participants described several stretches of time for being held in segregation. Only their last reported time in segregation was calculated in this study. One participant provided conflicting information regarding their dates by reporting two different amounts of times out of prison. This may be attributed to being incarcerated and released multiple times within the last 9 months or confusion by the question. The later time was utilized for this study. This study recorded their time out of prison by taking their most recent amount of time released they reported.

### **Attrition**

Three men vaguely reported having been in "both types of incarceration" (men held in segregation and general population). Because they did not clarify time in segregation or time out, they were removed from the study. Two participants responded with time in segregation as "a mixture" of both isolation and mainline and both responses were deleted due to unspecified time in and out of segregation. Four of the online surveys had to be deleted because the RAADS-14 or the AQ-10 were not completed. Fifteen

surveys were missing data (time in or time out) and were inserted in the SPSS analyses as missing data and were not included in the final statistics. Two individuals' responses were rejected because they originated in countries outside of the U.S. Several participants were taken out because they reported being females. Three participants with reported diagnoses of schizophrenia were removed from the study. Fourteen participants with completed survey questions were not included because they did not sign the informed consent agreement.

Two of the individuals in the study appeared to respond haphazardly on the RAADS-14 by endorsing all "Never true" responses (denying all symptoms), but also endorsing number (6), which is reversed and states, "I can chat and make small talk with people." Their responses were included in the study. One participant received the survey by postal mail from a reentry service provider who had requested it and had sent it back from within a prison. He endorsed "yes" when asked if out of segregation when he filled the survey and having been housed in a different prison. He also described being "recently back in incarceration" suggesting that he had been out when he received the survey by postal mail but was currently incarcerated. This survey was included in the study. One participant's responses were thrown out because he reported having been continuously incarcerated.

### **Analysis of the Data: Questioning the Hypothesis**

Data was converted using SPSS version 24 software. Due to data provided during the collection, a Chi squared was no longer utilized due to the organization of data provided after the collection. A multiple regression was used to measure the impact of dependent variable (the score on the AQ-10 to test positive for autistic symptoms) when

evaluating segregation time, time out since segregation, and other diagnoses which may impact reports of reported present day symptoms. The research question examined the hierarchical impact of pre-existing diagnoses of ADHD, DCD, LD, or schizophrenia and time out of segregation and time in segregation.

Before the inferential statistics were utilized to explore the primary hypothesis question, an evaluation of the original data was initiated. For the incarceration variables the data was not normally distributed and showed a log normal distribution. Therefore, the data were normalized using a natural log transformation. Both the time variables (time in segregation and time out since being in segregation) were significantly skewed and the pattern of the skew resembled a log normal distribution. The two time variables were transformed to  $\log_{10}$  and after transforming the logarithm the data was normally distributed. All other assumptions of multiple regression were met.

Looking at the correlations, a significant correlation was found between ADHD/DCD and LD having a relationship of .344 and .258,  $p = .014$  (See Table 1). These individuals who endorsed ADHD/DCD/LD scored significantly high on the AQ-10.

**Table 1:** Pearson correlations of the AQ-10 and predictor variables

\*Correlations were significant

		<b>AQ-10 Scores</b>	<b>ADHD</b>	<b>LD</b>	<b>DCD</b>	<b>Schizophrenia</b>	<b>Time out of seg.</b>	<b>Time in seg.</b>
<b>Pearson Correlation</b>	<b>AQ-10 Score</b>	1.00	-.032	.258*	.344*	.307	-.154	.006
	<b>ADHD</b>	-.032	1.00	.484	.505	.467	.125	-.015
	<b>LD</b>	.258	.484	1.00	.635	.602	-.088	-.046
	<b>DCD</b>	.344	.505	.635	1.00	.963	-.198	-.026
	<b>Schizophrenia</b>	.307	.467	.602	.963	1.00	-.166	-.073
	<b>Time out of segregation</b>	-.154	.125	-.088	-.198	-.166	1.00	.177
	<b>Time in segregation</b>	.006	-.015	-.046	-.026	-.073	.177	1.00
<b>Sig. (1 tailed)</b>	<b>AQ-10 score</b>	.	.403	.023	.004	.008	.120	.482

\*Considered significant

A hierarchical multiple regression analysis was utilized to measure the relationship between several predictor variables (diagnoses of ADHD, DCD, and/or LD, then stepwise, time in segregation and time out since being segregated) and performance on the AQ-10. The only significant relationship was between AQ-10 scores and pre-existing diagnoses of ADHD or LD ( $F(4, 55) = 3.446, p = 0.014$  with an R squared of .200 (see Table 2). For both the hierarchical regressions (dependent variables AQ-10 and RAADS-14 Total which follows) the steps displayed little increments that accounted for the

variance, thus only the first step numbers are reported in the model summaries (Table 2 & Table 4).

**Model Summary**

**Table 2 Multiple Regression correlating scores on the AQ-10 to predictor variables**

Model	R	R Squared	Adjusted R Squared	Std. Error of the Estimates	R squared change	F change	df	Sig. F change
1	.448	.200	.142	1.701	.200	3.446	4,55	.014
2	.448	.201	.126	1.716	.00	.006	1,54	.938
3	.448	.201	.110	1.733	.00	.00	1,53	.994

a Predictors: (Constant), Schizophrenia, ADHD, DCD, LD,

b. Predictors: (Constant), Schizophrenia, ADHD, DCD, LD, Time in segregation, Time out since segregated

c. Predictors: (Constant), Schizophrenia, ADHD, DCD, LD, Time in segregation, Time out since segregated

Dependent Variable: AQ-10 Score

Table 2A. AQ-10 predictors ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.879	4	9.970	3.446	.014b
	Residual	159.105	55	2.893		
	Total	198.983	59			
2	Regression	39.897	5	7.979	2.708	.030c
	Residual	159.087	54	2.946		
	Total	198.983	59			
3	Regression	39.897	6	6.649	2.215	.056d
	Residual	159.087	53	3.002		
	Total	198.983	59			

a Dependent Variable: AQ-10 Score

b. Predictors: (Constant), Schizophrenia, ADHD, DCD, LD,

c. Predictors: (Constant), Schizophrenia, ADHD, DCD, LD, Time in segregation, Time out since segregated

d. Predictors: (Constant), Schizophrenia, ADHD, DCD, LD, Time in segregation, Time out since segregated

A reported ADHD diagnosis did predict performance on the AQ-10 ( $b = -1.036, p < .031$ )

(see Table 3). Non-significant predictors for autistic symptoms reported on the AQ-10 ( $b$

$= .595, p < .611$ ) were LD ( $b = .425, p < .365$ ), DCD ( $b = 2.869, p < .093$ ), Schizophrenia

( $b = -1.114, p < .369$ ), “time in segregation” ( $b = .002, p < .994$ ) and “time out since being segregated” ( $b = -.031, p < .939$ ).

**Table 3 Predicting the AQ-10 Score based on each of the Predictor variables**

Coefficients		95% CI				
Model		B	Std. Error	Beta	t	Sig
1	<b>(Constant)</b>	.595	1.163		.512	.611
	<b>ADHD</b>	-1.036	.468	-.320	-2.214	<b>.031*</b>
	<b>LD</b>	.425	.466	.147	.913	.365
	<b>DCD</b>	2.869	1.678	.807	1.710	.093
	<b>Schizophrenia</b>	-1.114	1.228	-.409	-.907	.369
2.	<b>(Constant)</b>	.647	1.347		.480	.633
	<b>ADHD</b>	-1.025	.491	-.317	-2.089	.041
	<b>LD</b>	.425	.470	.147	.903	.370
	<b>DCD</b>	2.842	1.730	.799	1.643	.106
	<b>Schizophrenia</b>	-1.102	1.249	-.405	-.882	.382
3.	<b>Time out of segregation (Constant)</b>	-.031	.390	-.010	-.078	.938
	<b>(Constant)</b>	.648	1.362		.476	.636
	<b>ADHD</b>	-1.025	.496	-.317	-2.065	.044
	<b>LD</b>	.425	.475	.147	.894	.375
	<b>DCD</b>	2.839	1.787	.798	1.588	.118
	<b>Schizophrenia</b>	-1.100	1.289	-.404	-.853	.397
	Time out of segregation	-.031	.403	-.010	-.077	.939
	Time in segregation	.002	.263	.001	.007	.994

Dependent Variable: AQ-10  
 Predictor variables: ADHD, LD, Schizophrenia  
 Time out since segregated, time in segregation

A regression analysis was performed comparing the total accumulated score (above the 22-point autism cut-off) on the RAADS-14 total with step-wise predictor variables of ADHD, LD, and DCD, followed by “time out since segregated” and “time in segregation” (See Table 4 and Table 5). The total accumulated score on the RAADS-14 was the added total of each of the response alternatives on a Likert scale (ranging from 0 to 3 points) representing the length of the symptom (“True now and when I was young” [TNWY] 3 points, “True only now” [TON] 2 points, “True only when I was younger than 16” [TO16] 1 point, and “Never true” [NT] 0 points) (Eriksson et al., 2012).

All the predictor variables together (diagnoses of ADHD, DCD, and LD, “Time in segregation”, “Time out of segregation”) accounted for only 22% of the variance in the autistic symptoms on the RAADS-14 ( $R_2 = .022$ ,  $F(4, 55) = 3.869$ ,  $p = 0.008$ ) (see Table 4).

**Table 4: Regression analysis of the RAADS-14 Total score with predictor variables**

Model	R	R Squared	Adjusted R Squared	Std. Error of the Estimates	R squared change	F change	df	Sig. F change
1	.469a	.220	.163	7.605	.220	3.869	4,55	.008
2	.485b	.235	.164	7.599	.015	1.080	1,54	.303
3	.490c	.240	.154	7.644	.005	.368	1,53	.547

- a. Predictors: (Constant), Schizophrenia, ADHD, LD, DCD
- b. Predictors: (Constant), Schizophrenia, ADHD, LD, DCD, Time out of segregation
- c. Predictors: (Constant), Schizophrenia, ADHD, LD, DCD Time out of segregation, Time in segregation

As shown in the RAADS-14 total regression on Table 5, there was a significant relationship where a diagnosis of ADHD predicted reported autistic symptoms on the RAADS-14 Total ( $b = -7.432$ ,  $p < .001$ ).

**Table 5: RAADS Total Score Regression to predict Autism Symptoms Reported.**

<b>Model</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>1</b>	Regression	894.962	4	223.741	3.869	.008b
	Residual	3180.688	55	57.831		
	Total	4075.650	59			
<b>2</b>	Regression	957.339	5	191.468	3.316	.011c
	Residual	3118.311	54	57.747		
	Total	4075.650	59			
<b>3</b>	Regression	978.848	6	163.141	2.792	.020d
	Residual	3096.802	53	58.430		
	Total	4075.650	59			

### **Utilizing the RAADS-14 to evaluate reported present day autistic symptoms**

Reported present day symptoms utilizing the RAADS-14 “True only now” column prior to data collection was another prediction that was considered for this study. The assumption reported to the main author of the RAADS-14, Jonna Eriksson (Eriksson personal communication, Dec. 11, 2015) was that adult men would develop autistic symptoms later on in life after incarceration that did not exist in childhood. The secondary utilization of the RAADS-14 was to distinguish those individuals who reported present day autistic symptoms (“True only now” column) and to eliminate those individuals who exhibited reported autistic symptoms early on in life (True now and when I was young and “True when I was 16”). Given the assumption that these men were reporting symptoms of autistic symptoms later in life due to the type of incarceration, the RAADS-14 was used to eliminate those individuals with preexisting childhood onset autism. It was suggested to the author that the results would display that those men held longer in segregation would significantly endorse more responses in the “True only now” column meaning that men were experiencing autistic symptoms that were not present prior to



being incarcerated (not the columns “True now and when I was young” or “True when I was 16).

The Mann-Whitney was utilized because the ordinal information collected was rankings. For the analysis of the data, the Mann-Whitney was used to evaluate the participant’s pairwise information (between groups): a week or less in segregation versus more than a week in segregation (short v. long). The dependent variable was the ranking data, the frequency of autistic symptoms endorsed in the four columns on the RAADS-14 (TNWY, TON, TO16, and NT) (See Table 7). For the Mann Whitney computation it added up the totals based on the frequency of items endorsed, and not the total accumulated value with the assigned value of each score as indicated in the regression of the RAADS-14 Total (refer back to Table 4 and 5). The Mann-Whitney incorporated the frequency count of each of the columns (separate time durations: “True now and when I was young,” “True only now,” “True only when I was younger than 16,” and “Never true”) by comparing the means of those held in segregation less than a week to those housed more than a week. Because item number (6) had a different scoring value assigned to it (the opposite 0-3 point value) it was excluded in the frequency count total.

### Ranks

	seg_grp	N	Mean Rank	Sum of Ranks
RAADS TON	Short	41	40.70	1668.50
	Long	57	55.83	3182.50
	Total	98		

**Test Statistics<sup>a</sup>**

RAADS TON	
Mann-Whitney U	807.500
Z	-2.671
Asymp. Sig. (2-tailed)	.008

a. Grouping Variable: seg\_grp

The four mean ranks of each of the columns were compared in the analysis. Looking at Table 7 (ranks) there were significant scores between the mean rank scores of the RAADS “True only now” column short amount of time (Mean rank = 40.70) versus long (Mean rank = 55.83) There was a statistically significant difference in the RAADS-14 “True only now” subscale column (p = .008). Formerly incarcerated individuals who were segregated more than 1 week endorsed more autistic symptoms (Mean rank =40.70) when compared to inmates who were segregated a week or less (Mean rank = 55.83 The Mann Whitney results were U = 807.500, z = -2.671, p = .008. Looking at the RAADS-14 Total mean ranks, the results report that overall men who were segregated longer than a week were reporting more autistic symptoms overall (U = 914.00, z = -1.835, p = .067) (See Table 8).

**Table 7 Mean ranks between short term/long term segregation for frequency of current symptoms on the “True only now” column**

		Ranks		
seg_grp		N	Mean Rank	Sum of Ranks
RAADS Total	Short	41	43.29	1775.00
	Long	57	53.96	3076.00
	Total	98		

**Test Statistics<sup>a</sup>**

	RAADS Total
Mann-Whitney U	914.000
Wilcoxon W	1775.000
Z	-1.835
Asymp. Sig. (2-tailed)	.067

## **Chapter V. Discussion**

### **Findings of the Study**

This study was utilized to quantitatively measure the unique symptoms found in recently released men from segregation, autistic symptoms that may resemble a “pseudo-autistic” condition that may be related to difficulties associated with deficits in the mirror neuron system due to social isolation. This study measured self-reported present-day autistic symptoms in formerly incarcerated men who were housed in segregation units in prisons or jails for various amounts of time utilizing the AQ-10 and the RAADS-14. Their scores were compared to the scores of those who were never housed in segregation. This study did not find significant results for the main hypothesis that men held in segregation would significantly endorse more autistic symptoms on the AQ-10. A pre-existing diagnosis of ADHD did predict performance on the AQ-10 but none of the time predictors (Time in segregation or time out of segregation) significantly predicted autistic symptoms. All of the predictors together accounted for only 20% of the variance in autistic symptoms. Subsequently, none of the other subscales on the RAADS-14 were significant based on segregation time, only a pre-existing diagnosis of ADHD. The significant results showed that there was a relationship between current autistic symptoms reported on the RAADS-14 “True only now” subscale column for those formerly incarcerated men housed in segregation longer than a week when compared to those men housed less than a week.

Formerly incarcerated men may have endorsed “True only now” autistic symptoms on the RAADS-14 that was built to reflect the diagnostic symptom criteria in

ASD by measuring “mentalizing deficits,” sensory reactivity, and social anxiety (Eriksson et al., 2013), whereas they did not endorse items measured on the AQ-10 test, items that measure attention switching, imagination, communication, social interaction, and attention to detail (Allison et al., 2012; Baron-Cohen et al., 2001). The AQ-10 and the AQ were created to measure the “degree” of exhibiting characteristic autistic symptoms versus the RAADS-R a predecessor of the RAADS-14, which was built to assist with measuring symptoms based on the ASD diagnosis in the DSM-5 (Allison et al., 2012; Baron-Cohen et al., 2001; Eriksson et al., 2013). It is possible that these men may have minimal autistic symptoms and that the RAADS-14 was measuring other symptoms of similar or overlapping diagnoses.

Past research has shown that both ASD and ADHD, two distinct disorders, display a significant overlap of core symptoms such as difficulties with impulse control, social deficits, motor skills, anxiety, (Grzadzinski, Di Martino, Brady, Mairena, O’Neale, Petkova, Lord, & Castellanos, 2011) problems with executive functioning, deficits with theory of mind, sensory processing issues, and sleep disturbances (Kern, Geier, Sykes, Geier, & Deth, 2015) with ASD showing more severe difficulties with socializing and communication (Salley, Gabrielli, Smith, & Braun, 2015). Although the disorders display complex genetic and neurophysiologically shared origins (for review see Matson, Rieske, & Williams, 2013), both disorders have shown that some of the symptomology has been found to involve the inferior parietal cortex (Brieber, Neufang, Bruning, Kamp-Becker, Remschmidt, Herpertz-Dahlmann, Fink, & Konrad, 2007; Mahajan, Dirlikov, Crocetti, & Mostovsky, 2016) the same location of the mirror neuron system as previously discussed in this study.

This study discussed past research on Romanian orphans who endured institutionalized deprivation during the Ceausescu Regime in the 1980's who displayed autistic symptoms and also were found to display symptoms of difficulties with inattention, inhibition control (Pollak, Nelson, Schlaak, Roeber, Wewerka, Wiik, Frenn, Loman, & Gunnar, 2010), and residual problems including over-activity and impulsivity as found in ADHD diagnoses (Audet & Le Mare, 2010; Stevens, Kumsta, Kreppner, Brookes, Rutter, & Sonuga-Barke, 2009). The significant number of participants who endorsed exacerbated autistic symptoms on the RAADS-14 may reflect research suggesting that ADHD and ASD fall on a continuum.

### **Limitations**

Author Eriksson (personal communication, October 3, 2016) described that the RAADS-14 is a screening tool that was designed to initiate further assessment for a full ASD diagnosis with high specificity to find individuals with potential ASD and limited specificity to exclude ADHD, or other drug and alcohol related disorders with co-occurring symptoms. Utilizing the RAADS-14 on formerly incarcerated individuals with a high prevalence of these other potential symptoms, this may have confounded the results.

This study reflects autistic symptoms that were significantly greater after having been housed in segregation units in prisons and jails for more than a week. The limitations to these findings were that the responses of the formerly incarcerated individuals spanned across a large time frame from weeks to years. Similarly, there were two participants whose time out was defined by parole, time frames that were not exact and may have impacted the association of incarceration and autistic symptoms.

Two individuals in this study reported time in segregation across years. When asked for clarification, they described going into and out of segregation and general population as the time they reported. They had summed up their time in segregation without considering having been regularly returned to being socialized. They reported combined time in and out with a general response that inaccurately did not reflect the definition provided on the inclusion questions (see Appendix D) for being held in social segregation. They were asked to describe their last continuous time in segregation. The study may not have specifically clarified that it was attempting to measure the impact of social segregation continuously without having been returned to social mainline/general population and being re-exposed to social interaction. This confusion may have impacted several respondents' answers that may have contributed to the final results.

Because of inconsistencies in data collection, several prescriptions and best guess estimates were made with the participant's responses regarding time in and since being segregated. Conclusions about time in and out of segregation were made by comparing their overall responses to the inclusion questions. If a confident guess was not made, the participant's responses were not included in the final evaluation. Several participants did not provide exact dates for time having been out of social isolation, thus approximations had to be made by utilizing time released out of prison. This may have resulted in a longer time out of segregation and symptoms that this study attempted to measure may have lessen due to re-socialization.

**Recommendations**

Because formerly incarcerated men endorsed autistic symptoms now having been released from segregation, prison systems and reentry support programming should consider to appropriately assess and address these individual symptoms and how they impact their success and reintegration back into the community to lower recidivistic rates. Because the RAADS-14 is derived from the symptoms in the DSM-5, each of the areas of deficits specific to each formerly incarcerated individual should be supported in a therapeutic and rehabilitative setting.

**Questions for Future Research:**

Studies on the mirror neuron system detail how relating and empathizing with other people is a function of these regions in the brain that segregation may be impacting and future studies should explore more thoroughly. It is recommended that criminal correctional systems focus on providing those impacted by incarceration in segregation with a therapeutic experience that is contingent on receiving feedback and positive role models reflecting socially appropriate behaviors and responses. Do men and women in segregation units when compared to those recently released endorse more autistic symptoms qualifying for a “pseudo-autistic” condition? During this study a small group of participants, a group of men who had been held in segregation for a significant amount of time (average ten years) and had not been recently released reported some autistic symptoms that were more enduring as based on how they described the impact in their lives. They described heightened social alienation and social anxiety. One participant in the study who had been released from segregation within a month reported: “I do not feel normal anymore. I feel abnormal and I have difficulties with social settings. It’s like a



combination of a lack of empathy or just not relating to people. I feel dehumanized. I feel disconnected from people and I feel more anxious. I still have difficulties relating and communicating with others.” This individual described an experience where he went to a mall and became immobilized in fear being around people. Someone had to come and assist him out. VV, (June, 2016)

This testimony reflected the pseudo-autistic condition this study attempted to measure. Future considerations should compare the symptoms of those currently segregated to those individuals recently released. It is recommended that future research consider asking individuals who are newly released from incarceration. As they are reintroduced back into society and socializing with others, the symptoms may appear to dissipate as seen in results in this study that are not discussed in detail. Considerations should also measure autistic symptoms prior to being segregated and after incarceration. Research should similarly consider other possible diagnoses that resemble an autistic condition such as schizophrenia, ADHD, and other substance use disorders.

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**APPENDIX A**

**Copy of Email to Re-entry Service Providers:**

Email initially sent out through the Internet to introduce the study and request re-entry service providers to assist in identifying former incarcerated individuals that they work with to participate in the study through the hyperlink included at the bottom. The letter provided a brief summary of the purpose and importance of the study, a brief description of the type of participants that were being asked to participate, that participation was strictly voluntary, that the study would be completed on-line, the number and type of research instruments to be completed, the estimated length of time required to participate in the study, and the option for the formerly incarcerated individual to qualify for one of four lottery (Gift Cards) worth \$35. This email was sent out to reentry service providers throughout the U.S.



Hello, my name is Veronica V Solaris. I am a fourth-year doctoral student at Alliant International University. I am doing a study looking at the experiences of men recently released from **solitary confinement**. I am also looking at the men who were held in general population cells or with another inmate. **I am asking community reentry service providers such as yourself if you are willing to ask a formerly incarcerated individual that you have worked with if they would like to volunteer to participate in a study about their experiences while in prison or jail. A reentry service provider is any individual who supports the reentry of a former incarcerated individual into the community with help (parole/probation officers, mental health workers, housing or career support, substance abuse counselors, addiction support (AA), lawyers, case managers or spiritual clergy in a faith based program).**

**They will be asked to answer 37 questions about their personal preferences.** Formerly incarcerated individuals who complete the study will be eligible for one of four lottery Gift Cards worth \$35.00. Participation in this study will take about 15-20 minutes to finish.

Although participants may not benefit directly from this study, their responses may be used to bring awareness to the general population and public officials about treatment of individuals in prison/jail and help improve the transition of individuals into society once they are released from incarceration.

We are asking that you consider assisting in the recruitment of former incarcerated individuals by forwarding the attached link below: "Email to Former Incarcerated Individuals" or email this page to individuals who you know and are:

- Formerly incarcerated individuals;
- Are between 18 and 85 years of age;
- Have been imprisoned for a minimum of five months;
- Can read and understand English with a minimum of 7<sup>th</sup> grade reading level.

**Please note that participation in this study by the formerly incarcerated individual is strictly voluntary. Please email me at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) if you want someone to participate by postal mail.**

If you have any questions about this study, please feel free to contact me by email at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Arinn Testa at (415) 505 0588 or [atesta@alliant.edu](mailto:atesta@alliant.edu). **Thank you for your consideration in assisting to recruit formerly incarcerated individuals for this important study.**

If you would like to receive this survey by postal mail, please contact me at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu).

Veronica V Solaris, MSCP. MA.

Psy.D Student, Clinical Forensic Psychology  
California School of Forensic Studies  
Alliant International University  
San Francisco Campus  
[vsolaris@alliant.edu](mailto:vsolaris@alliant.edu)

You may copy and paste this link provided, or forward this email to the formerly incarcerated individual for them to participate.

**APPENDIX B**

**Copy of Brief Version of the Recruitment letter**



Hello, my name is Veronica V Solaris. I am a fourth-year doctoral student at Alliant International University. I am doing a study looking at the experiences of men recently released from **solitary confinement**. I am also looking at the men who were held in general population cells or with another inmate. **I am asking community reentry service providers such as yourself if you are willing to ask a formerly incarcerated individual that you have worked with if they would like to volunteer to participate in a study about their experiences while in prison or jail. They will be asked to answer 37 questions about their personal preferences.** Those individuals who complete the study will be eligible for one of four lottery Gift Cards worth \$35.00. Participation in this study will take about 15-20 minutes to finish. Please consider sharing this email link to other reentry service providers working with these potential participants.

**If you would like to receive this survey by postal mail, please contact me at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu).**

Thank you.

Link to view full Recruitment Letter and link to the survey.

**APPENDIX C**

**Copy of Information Form for Former Incarcerated Individuals (FII's)**



The email containing the recruitment letter and hyperlink provided to reentry service providers to give to formerly incarcerated individuals and the “direct link” email formerly incarcerated individuals found online both lead them to enter the Qualtrics online system to this screen form. The Instruction Form provides a brief summary of the purpose and importance of the study, a brief description of the type of participants that are being recruited, informs individuals that participation is strictly voluntary, informs prospective participants that the study will be completed on-line, informs possible participants about the number and type of research instruments to be completed, the estimated length of time expected to participate in the study, and that as participants of the study they are eligible for an inducement of one of four gift cards worth \$35.



Hello, my name is Veronica V Solaris. I am a doctoral student at Alliant International University. I am doing a study with individuals who were previously incarcerated and are now out of prison or jail. You have been contacted because you are a former incarcerated male between the ages of 18 and 85, were released from prison/jail for at least five months and you understand and can read in English.

**I am asking you to consider participating in this important study. Please know that it is completely your choice to participate or not participate. Your participation is strictly voluntary.** Also, even if you decide to participate please know that you can refuse to answer any question and stop at any time. If you decide to participate, you will qualify to participate in a lottery for one of four \$35.00 gift cards.

**Please know that your participation in this study will be kept confidential, meaning that nobody will know that you took part in this study. Only my supervisor Dr. Testa and I will know that you participated. Please also know that any data collected from you will be kept in a computer account that only I have access to and that all data collected from you will be destroyed by me after it has been analyzed, but no later than five years after you have signed an agreement to participate.**

If you have questions about this study you may contact me via email at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Testa via email at [atesta@alliant.edu](mailto:atesta@alliant.edu) or by phone at (415) 505-0588. If you do not have questions for my supervisor or myself and wish to participate in this study you will be asked to click on the link below to get started. You will first be asked some questions to make sure that you are between the age of 18 and 85, are a former prisoner, were released from prison in the last nine months, was held in a cell for longer than five months, and was either in a general population cell/with a cell mate or in solitary confinement. If you meet these requirements, you will be invited to read an agreement to participate and complete two questionnaires regarding your daily life and past experiences.

Thank you for your consideration in participating in this study. If you decide to participate, please click below to begin answering the questions and to sign the Informed Consent.

Please complete this survey one week from receiving this email.

By clicking you agree to begin participating in this survey.

**[Qualtrics will direct subject to begin survey. Once they click on the button below it will connect them]**

**APPENDIX D**

**Copy of Pre-screening Inclusion Questionnaire**

**Please click on the answer that best applies to you.**

1. When you were last incarcerated, were you at least 18-years-of age?

- Yes
- No

2. Are you between the age of 18 and 85 years?

- Yes
- No

3. For this study being in isolation means that you were inside a cell alone for at least 22 to 23 hours a day, for about at least five days a week across a minimum of five months). This is often called solitary confinement, administrative segregation, secure housing units, the SHU, the hole, a disciplinary unit, or restrictive housing which means that you were housed alone for a minimum of five months.

Were you in prison or jail sometime within the **last nine months**?

- Yes
- No
- Other amount of time released and in isolation
- I was only in general population. Please write down how long imprisoned this last time and how long out

4. . When you were in prison/jail were you incarcerated for at least five months?

- Yes
- No

1. What type of cell were you in during that time?

-A. **An Isolation cell** (this means that you were inside a cell alone for at least 22 to 23 hours a day, for about at least five days a week across a minimum of five months). This is often called solitary confinement, administrative segregation, secure housing units, the SHU, the hole, a disciplinary unit, or restrictive housing which means that you were housed alone for a minimum of five months.

If in an isolation cell, how long has it been since that time?

-B. A general population cell or housed within another person for a minimum of five months

-C. Other situation:

An additional question to the participants who answer B. General population.

At any time while you were in prison in general population or at any point in your incarceration, where you ever in a solitary confinement cell alone?

- Yes
- No

If so, for how long?

Individuals who answer A. on question number 5. Will also be asked:  
How long were you in isolation?

**APPENDIX E**

**Copy of Participant Consent Form**



## Participant Agreement

My name is Veronica V. Solaris. I am a doctoral student doing a study about former incarcerated individuals held in prison/jail cells. I am working with Dr. Arinn Testa, my supervising teacher at Alliant International University. You have been invited to complete this study because you were previously in prison or jail.

Please know that participation in this study is strictly voluntary. If you do not want to participate in this study you will be asked to click on the button below that says: “No thank you, I do not want to participate in this study”. If you decide to participate, you will be asked to click on the button at the bottom of this page that says: “Yes, I am interested in participating in this study”.

If you decide to participate you will be asked 10 questions about your experiences in different situations and 21 additional brief background questions. Your total participation will take about 15 to 20 minutes to complete.

Please know that any information you provide will remain completely private and unidentified. Only my supervisor, Dr. Arinn Testa Psy. D and myself, Veronica V. Solaris will have access to answers that you provided.

If you have questions or concerns about this study or about your participation, please feel free to contact me, Veronica V. Solaris at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Arinn Testa, PsyD. at [atesta@alliant.edu](mailto:atesta@alliant.edu) or (415) 505-0588. You can also contact the Institutional Review Board at Alliant International University via email at [Alliant-irb@alliant.edu](mailto:Alliant-irb@alliant.edu) or via telephone at 858-635-4741. The Institutional Review Board makes sure that all individuals participating in research are protected according to the law.

At the end of the study if you need to speak with someone about your feelings, you may call **free of charge** the National Institute of Mental Health Hotline at **1-800-273-8255** or the American Psychological Association help line at (800) 374-2723.

Please know that if you are interested in the results of this study, summary results will be sent out if you choose to securely provide your email address.

Would you like to participate in this study? Please click your answer below:

- No thank you, I do not want to participate in this study
- **Yes, I am interested in participating in this study (Please either print this page or email this page to yourself so that you will have the contact numbers listed above in case you want to speak with someone during or after your participation).**

**APPENDIX F**

**Copy of Autism Quotient-10  
(General Survey)**

**Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001  
Allison, Auyeung, & Baron-Cohen 2012**



### General Survey

Below is a list of statements. Please read each statement very carefully and rate how strongly you agree or disagree with it by checking your answer.

1. I often notice small sounds when others do not:	definitely agree	slightly agree	slightly disagree	definitely disagree
2. I usually concentrate more on the whole picture, rather than the small details:	definitely agree	slightly agree	slightly disagree	definitely disagree
3. I find it easy to do more than one thing at once:	definitely agree	slightly agree	slightly disagree	definitely disagree
4. If there is an interruption, I can switch back to what I was doing very quickly:	definitely agree	slightly agree	slightly disagree	definitely disagree
5. I find it easy to 'read between the lines' when someone is talking to me:	definitely agree	slightly agree	slightly disagree	definitely disagree
6. I know how to tell if someone listening to me is getting bored:	definitely agree	slightly agree	slightly disagree	definitely disagree
7. When I'm reading a story I find it difficult to work out the characters' intentions:	definitely agree	slightly agree	slightly disagree	definitely disagree
8. I like to collect information about categories of things (e.g. types of car, types of bird, types of train, types of plant etc.):	definitely agree	slightly agree	slightly disagree	definitely disagree

9. I find it easy to work out what someone is thinking or feeling just by looking at their face:	definitely slightly slightly definitely agree agree disagree disagree
10. I find it difficult to work out people's intentions:	definitely slightly slightly definitely agree agree disagree disagree

**APPENDIX G**

**Copy of Pre-existing Symptom Inventory**

**(Ritvo Autism and Asperger's Diagnostic Scale Revised RAADS-14 with seven  
additional screening questions)**

**Eriksson, Andersen, & Bejerot, 2013**

**(The original screener without the title was used:  
<https://www.biomedcentral.com/content/supplementary/2040-2392-4-49-S1.pdf>)**

### Brief Questionnaire

Please carefully read and answer the following questions. If you feel that you are getting upset with any question, please consider going to the next question before returning to the question that makes you upset. If you feel that you do not want to answer a question, please leave it blank.

**Please choose one of the following alternatives:**

This is true or describes me now and when I was young.

This was true or describes me only now (refers to skills acquired).

This was true only when I was young (16 years or younger).

This was never true and never described me.

Please answer the questions according to what is true for *you*. Check only one column per statement!

Some life experiences and personality characteristics that may apply to you

1. It is difficult for me to understand how other people are feeling when we are talking:
  - True now and when I was young.
  - True only now.
  - True only when I was younger than 16.
  - Never true.
  
2. Some ordinary textures that do not bother others feel very offensive when they touch my skin.
  - True now and when I was young.
  - True only now.
  - True only when I was younger than 16.
  - Never true.
  
3. It is very difficult for me to work and function in groups.
  - True now and when I was young.
  - True only now.
  - True only when I was younger than 16.
  - Never true.
  - Never has never been true of me
  
4. It is difficult to figure out what other people expect of me.
  - True now and when I was young.
  - True only now.

- True only when I was younger than 16.
- Never true.

5. I often don't know how to act in social situations

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

6. I can chat and make small talk with people easily.

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

7. When I feel overwhelmed by my senses, I have to isolate myself to shut them down.

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

8. How to make friends and socialize is a mystery to me.

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

9. When talking with someone, I have a hard time telling when it is my turn to talk or to listen.

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

10. Sometimes I have to cover my ears to block out painful noises (like vacuum cleaners or people talking too much or too loudly).

- True now and when I was young.

- True only now.
- True only when I was younger than 16.
- Never true.

11. It can be very hard to read someone's face, hand, and body movements when we are talking.

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

12. I focus on details rather than the overall idea.

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

13. I take things too literally, so I often miss what people are trying to say.

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

14. I get extremely upset when the way I like to do things is suddenly changed

- True now and when I was young.
- True only now.
- True only when I was younger than 16.
- Never true.

(Additional questions on the Brief Questionnaire)

15. Before ever being in prison or jail, did a doctor ever tell you that you had Developmental Coordination Disorder

- Yes
- No

16. Before ever being in prison or jail, did a doctor ever tell you that you had Autism?

- Yes

- No

17. Before being in prison or jail, did a doctor ever tell you that you had schizophrenia?

- Yes
- No

18. Before ever being in prison or jail, did a doctor ever tell you that you had Asperger's Disorder?

- Yes
- No

19. Before being in prison or jail, did any doctor tell you that you had ADHD?

- Yes
- No

20. Before being in prison or jail were you ever diagnosed with a learning disability?

- Yes
- No

21. Have you experienced difficulties in your life because of symptoms that have developed since being in prison/jail (getting housing, getting a job, relationships, substance use, etc.)

- Yes.
- No.
- Other

**APPENDIX H**

**Copy of Participant Debriefing Statement**



**Thank you** for your participation in this important study. Your answers will help us better understand the experiences of previously incarcerated individuals and how these experiences are influencing their lives today.

Please be assured that your answers to will remain completely private. Only me, Veronica V. Solaris and my supervisor Dr. Arinn Testa, Psy.D. will have access to answers that you provided.

Should you have questions or concerns about this study or about your participation, please feel free to contact me at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Testa. at (415) 505-0588, or the Institutional Review Board at the California School of Professional Psychology at Alliant International University via email at [Alliant-irb@alliant.edu](mailto:Alliant-irb@alliant.edu) or via telephone at 858-635-4741. The Institutional Review Board makes sure that all individuals participating in research are protected according to the law.

Should you need to speak with someone about your feelings as a result of this study, you may contact (free of charge) on the telephone the National Institute of Mental Health Hotline at **1-800-273-8255** or the A.P.A. help line at (800) 374-2723.

Please know that summary results of this study will be available no later than December 31, 2016.

Finally, in partial appreciation for you participation in this study, you are eligible (through a lottery drawing) to win one of four \$35 Gift Cards. Are you interested in participating in the Gift Card lottery?

- a. No, thank you. I would like to just submit my responses.
- b. Yes, please include me in the lottery for **one of four \$35.00 Gift Cards**. I understand that by clicking on this option I will be redirected to a separate site to enter my contact information.

**Thank you again for your participation in this important study.**

**APPENDIX I:**

**Copy of Direct Link for Formerly Incarcerated Individuals and direct websites:**

The brief email and recruitment letter addressed directly to formerly incarcerated individuals and containing the hyperlink to the online survey. This letter provided basic recruitment information about the intent of the study, the requirements for participation, the voluntary nature of the study, and the inducement (chance to obtain one of four gift cards). The Direct Link was posted on reentry support system newsletters, websites and social media sites.



Hello, my name is Veronica V Solaris. I am a fourth-year doctoral student at Alliant International University. I am doing a study looking at the experiences of men recently released from **solitary confinement**. I am also looking at the men who were held in general population cells or with another inmate. **I am asking you if would like to volunteer to participate in a study about your experiences while in prison or jail. You will be asked to answer 37 questions about your personal preferences.** Those individuals who complete the study will be eligible for one of four lottery Gift Cards worth \$35.00. Participation in this study will take about 15-20 minutes to finish. Please consider sharing this email link to other potential participants.

Although you may not benefit directly from this study, your responses may be used to bring awareness to the general population and public officials about treatment of individuals in prison/jail and help improve the transition of individuals into society once they are released from incarceration.

I am looking for:

- Formerly incarcerated individuals;
- Are between 18 and 85 years of age;
- Have been imprisoned for a minimum of five months;
- Can read and understand English with a minimum of 7<sup>th</sup> grade reading level.

**Please note that participation in this study is strictly voluntary.**

If you have any questions about this study, please feel free to contact me by email at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Arinn Testa at (415) 505 0588 or [atesta@alliant.edu](mailto:atesta@alliant.edu). **Thank you for your consideration in participating in this study. If you would like to receive this survey by postal mail, please contact me at vsolaris@alliant.edu.**

Veronica V Solaris, MSCP. MA.  
Psy.D Student, Clinical Forensic Psychology  
California School of Forensic Studies  
Alliant International University  
San Francisco Campus  
[vsolaris@alliant.edu](mailto:vsolaris@alliant.edu)

Link to view Instruction Form for FII and link to the survey.

**APPENDIX J**

**Copy of Recruitment Letter for FII  
Postal Mail**



Hello, my name is Veronica V Solaris. I am a fourth-year doctoral student at Alliant International University. I am doing a study looking at the experiences of men recently released from **Solitary Confinement**. I am also looking at the men who were held in general population cells or with another inmate.

I am doing an important study looking at the experiences of men recently released from **Solitary Confinement**. I am asking you, a former incarcerated individual if you would like to volunteer to participate in a study about your personal preferences.

**You will be asked to answer 37 questions about your personal preferences.** Formerly incarcerated individuals who complete the study will be eligible for one of four lottery Gift Cards worth \$35.00. Participation in this study will take about 15-20 minutes to finish.

**Please know that your participation in this study will be kept confidential, meaning that nobody will know that you took part in this study. Only my supervisor Dr. Testa and I will know that you participated. Please also know that any data collected from you will be kept in a computer account and a locked box that only I have access to and that all data collected from you will be destroyed by me after it has been analyzed, but no later than five years after you have signed an agreement to participate.**

Although participating may not benefit you directly from this study, your responses may be used to bring awareness to the general population and public officials about treatment of individuals in prison/jail and help improve the transition of individuals into society once they are released from incarceration.

You are eligible for this study if you are:

- Formerly incarcerated individuals;
- Are between 18 and 85 years of age;
- Have been imprisoned for a minimum of five months;
- Can read and understand English with a minimum of 7<sup>th</sup> grade reading level.

**Please note that participation in this study by the formerly incarcerated individual is strictly voluntary.**

If you have any questions about this study, please feel free to contact me by email at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Arinn Testa at (415) 505 0588 or [atesta@alliant.edu](mailto:atesta@alliant.edu). If you don't have questions for my supervisor or myself you will be asked to answer the six Demographic questions. After this you will be invited to read the Consent Agreement asking you to participate and complete the two questionnaires regarding your daily life and past experiences.

**Thank you for your consideration in participating in this study. If you decide to participate, please answer the questions, sign the Consent form and keep a copy for yourself. Please return in the pre-paid envelope:**

- 1. Demographic Questions**
- 2. Consent Form**
- 3. General Survey**
- 4. Basic Questionnaire**
- 5. Any questions or requests to qualify for the chance to obtain a \$35 gift card.**

Veronica V Solaris, MSCP. MA.  
Psy.D Student, Clinical Forensic Psychology  
California School of Forensic Studies  
Alliant International University  
San Francisco Campus  
[vsolaris@alliant.edu](mailto:vsolaris@alliant.edu)

**This study can also be reached by typing and submitting by email:**

[https://alliant.qualtrics.com/SE/?SID=SV\\_cN2ys4IBea73Rqd&Link=2](https://alliant.qualtrics.com/SE/?SID=SV_cN2ys4IBea73Rqd&Link=2)

**APPENDIX K**

**Copy of Postal Inclusion Questions Form**



**Please circle the answer that best applies to you.**

1. When you were last incarcerated, were you at least 18-years-of age?

-Yes

-No

2. Are you between the age of 18 and 85 years?

- Yes

- No

3. For this study being in isolation means that you were inside a cell alone for at least 22 to 23 hours a day, for about at least five days a week across a minimum of five months). This is often called solitary confinement, administrative segregation, secure housing units, the SHU, the hole, a disciplinary unit, or restrictive housing which means that you were housed alone for a minimum of five months.

Were you in prison or jail sometime within the **last nine months**?

- Yes

- No

-Other amount of time released and in isolation

-I was only in general population. Please write down how long imprisoned this last time and how long out?

4. . When you were in prison/jail were you incarcerated for at least five months?

- Yes

- No

5. What type of cell were you in during that time?

**A-An Isolation cell** (this means that you were inside a cell alone for at least 22 to 23 hours a day, for about at least five days a week across a minimum of five months).

This is often called solitary confinement, administrative segregation, secure housing units, the SHU, the hole, a disciplinary unit, or restrictive housing which means that you were housed alone for a minimum of five months.

**If in an isolation cell, how long has it been since that time?**

**B. A general population cell** or housed within another person for a minimum of five months

**C-Other situation:**

6. If you answered A. to number 5., how long has it been since you've been out of that isolation cell?

How long were you inside an isolation cell?

After answering, please skip to the next form, **Participant Consent Form**. Do not answer number 7.

7. If you chose answers B. on question number 5., please answer the following question:

At any time while you were in prison in general population or at any point in your incarceration, were you ever in a solitary confinement cell alone?

**Yes.** If so, for how long?

**No**

**APPENDIX L**

**Copy of Postal Consent Form:**



### Participant Agreement

My name is Veronica V. Solaris. I am a doctoral student doing a study about former incarcerated individuals held in prison/jail cells. I am working with Dr. Arinn Testa, my supervising teacher at Alliant International University. You have been invited to complete this study because you were previously in prison or jail.

**Please know that participation in this study is strictly voluntary. If you decide to participate, you will be asked to send in the forms provided in the checklist included with the pre-paid envelope for you to return to the address provided.**

If you decide to participate you will be asked 10 questions about your experiences in different situations and 21 additional brief background questions. Your total participation will take about 15 to 20 minutes to complete.

Please know that any information you provide will remain completely private and unidentified. All paperwork will be kept in a locked box. Only my supervisor, Dr. Arinn Testa Psy. D and myself, Veronica V. Solaris will have access to answers that you provided.

If you have questions or concerns about this study or about your participation, please feel free to contact me, Veronica V. Solaris at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Arinn Testa, PsyD. at [atesta@alliant.edu](mailto:atesta@alliant.edu) or (415) 505-0588. You can also contact the Institutional Review Board at Alliant International University via email at [Alliant-irb@alliant.edu](mailto:Alliant-irb@alliant.edu) or via telephone at 858-635-4741. The Institutional Review Board makes sure that all individuals participating in research are protected according to the law.

At the end of the study if you need to speak with someone about your feelings, you may call **free of charge** the National Institute of Mental Health Hotline at **1-800-273-8255**) or the American Psychological Association help line at (800) 374-2723.

Please know that if you are interested in the results of this study, summary results will be sent out if you choose to securely provide your email address or physical address and returned in the envelope provided.

If you would like to participate in this study, please send back in the pre-paid envelope the forms indicated on the checklist

**Statement of Consent:** I have read this. I consent and agree to take part in the study.

Your Initials \_\_\_\_\_ Date \_\_\_\_\_

Please keep a copy of this informed consent form for your records.

**APPENDIX M**

**Copy of Debriefing Form Postal Mail**

**Thank you** for your participation in this important study. Your answers will help us better understand the experiences of previously incarcerated individuals and how these experiences are influencing their lives today.

Please be assured that your answers to will remain completely private. Only me, Veronica V. Solaris and my supervisor Dr. Arinn Testa, Psy.D. will have access to answers that you provided.

Should you have questions or concerns about this study or about your participation, please feel free to contact me at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Testa at (415) 505-0588, or the Institutional Review Board at the California School of Professional Psychology at Alliant International University via email at [Alliant-irb@alliant.edu](mailto:Alliant-irb@alliant.edu) or via telephone at 858-635-4741. The Institutional Review Board makes sure that all individuals participating in research are protected according to the law.

Should you need to speak with someone about your feelings as a result of this study, you may contact (free of charge) on the telephone the National Institute of Mental Health Hotline at **1-800-273-8255** or the A.P.A. help line at (800) 374-2723.

Please know that summary results of this study will be available no later than December 31, 2016.

Finally, in partial appreciation for you participation in this study, you are eligible (through a lottery drawing) to win one of four \$35 Gift Cards. If you are you interested in participating in the Gift Card lottery or receiving a copy of the results by email, please return this form and include your email and/or address so that you may be contacted.

**Thank you again for your participation in this important study.**

Please return in the pre-paid envelope the following forms:

1. Demographic Questions form
2. Consent Form signed
3. General Survey
4. Basic Questionnaire
5. Any questions or requests to qualify for the chance to obtain a \$35 gift card.

**APPENDIX N**

**Copy of Direct Link General Population**



Hello, my name is Veronica V Solaris. I am a fourth-year doctoral student at Alliant International University. I am doing a study looking at the experiences of men recently released from **prisons**. I am for men who were held in general population cells or with another inmate. **I am asking you if would like to volunteer to participate in a study about your experiences while in prison or jail. You will be asked to answer 37 questions about personal preference.** Those individuals who complete the study will be eligible for one of four lottery Gift Cards worth \$35.00. Participation in this study will take about 15-20 minutes to finish. Please consider sharing this email link to other potential participants.

Although you may not benefit directly from this study, your responses may be used to bring awareness to the general population and public officials about treatment of individuals in prison/jail and help improve the transition of individuals into society once they are released from incarceration.

I am looking for:

- Formerly incarcerated individuals;
- Are between 18 and 85 years of age;
- Have been imprisoned for a minimum of five months;
- Can read and understand English with a minimum of 7<sup>th</sup> grade reading level.

**Please note that participation in this study is strictly voluntary.**

If you have any questions about this study, please feel free to contact me by email at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu) or my supervisor Dr. Arinn Testa at (415) 505 0588 or [atesta@alliant.edu](mailto:atesta@alliant.edu). **Thank you for your consideration in participating in this study. If you would like to receive this survey by postal mail, please contact me at [vsolaris@alliant.edu](mailto:vsolaris@alliant.edu).**

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Psy.D Student, Clinical Forensic Psychology  
California School of Forensic Studies  
Alliant International University  
San Francisco Campus  
[vsolaris@alliant.edu](mailto:vsolaris@alliant.edu)

Link to view Instruction Form for FII and link to the survey.



**APPENDIX O**

**Copy of Re-entry Service Providers Search Procedures**

The initial search included researching the main Federal Bureau of Prisons Residential Re-entry Centers (RRC) Contract Directory online ([https://www.bop.gov/business/rrc\\_directory.jsp](https://www.bop.gov/business/rrc_directory.jsp)) and obtaining most site contact information. Several re-entry programs were reached through the “Parents with Incarcerated Children” resource list ([prisonmoms.net](http://prisonmoms.net)). General Internet searches for programs included using the terms *reentry programs*, *reentry transitional housing*, *housing for ex-prisoners*, and *transitional programs for offenders*.

For Probation Officers there was a search for email addresses and contact links through the American Probation and Parole Directory ([https://www.appa-net.org/eweb/DynamicPage.aspx?Webcode=VB\\_Directory](https://www.appa-net.org/eweb/DynamicPage.aspx?Webcode=VB_Directory)). For seeking out attorneys general searches included the terms *lawyers for ex-prisoners*, *legal aid*, *forensic legal services*, and *lawyers who work with former incarcerated individuals*. Therapists and psychologists were searched through the *Psychology Today* website.

For drug treatment centers general searches were made using the terms *drug treatment*, *drug rehabilitation centers*, *drug rehabilitation for offenders*, and *transitioning into the community*. There was also a comprehensive search for drug and treatment centers utilizing the Substance Abuse and Mental Health Services Administration directory (<https://findtreatment.samhsa.gov/>). Under drug treatment providers, searches included state Alcoholic Anonymous group meetings by reaching out to AA statewide district delegates, area chairs, archivists, registrars, and committees that involved the Correctional Committee Meetings and Bridging the Gap programs that often assist in the facilitation of drug rehabilitation as prisoners transition into the community (AA

Guidelines, 2014; Alcoholics Anonymous World Services, Inc., 1991). Several AA sites responded and refused to participate to preserve anonymity.

For faith based reentry service providers, the “Celebrate Recovery” website (<http://www.celebraterecovery.com>) which included many faith based parishes and support groups across the United States were contacted by email. Recruitment included reaching out to several nationwide Salvation Army drug Adult Rehabilitation Centers that often housed many individuals on parole and probation transitioning into the community from the prisons and the jails. Contacts were also made to providers on the Christian Care Network, a link obtained through a parole resource contact list online ([https://store.aacc.net/ccn/ccn\\_search.php?err=You%20must%20select%20at%20least%20one%20level%20of%20credentials%3Cbr%20/%3E](https://store.aacc.net/ccn/ccn_search.php?err=You%20must%20select%20at%20least%20one%20level%20of%20credentials%3Cbr%20/%3E)). Many independent prison ministries and ministries for ex-offenders across the U.S. were also sent recruitment emails. I also attended a southern California faith based reentry resource fair and handed out survey packets. General searches included *prison ministries* and *re-entry ministries*.

Emails were also sent out to helpforfelons.org Re-entry Programs for Ex-Offenders by State as well as all of the resources in the California Reentry Program website (<http://ca-reentry.org/>). The general recruitment letter for formerly incarcerated individuals (see Appendix I) was posted on several nationwide re-entry support systems newsletters, Facebook, the Jobs for Felons Hub weekly newsletter, and on the Every Black Event website. The study was also publicized on Anonymous Newark Radio podcast out of Ohio. Reaching out to the various programs listed in the searches above did not guarantee correspondence or participation in this study. Participation was voluntary and confidential.