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Application of Biopsychosocial Vulnerability-Stress Model To a Criminal Justice Population

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Abstract

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Abstract

This second of a three paper series that provides the progression of the development of the mid-range theory named the *Rediscovery of Self-care (RSC) Among Persons with an Incarceration Experience*. In the first paper of this series, a biopsychosocial vulnerability stress (VSM) model tailored to the criminal justice population was introduced. In this paper, the discussion seeks to integrate VSM with an understanding of the environmental factors and social determinants impacting correctional health outcomes. The coping response of individuals to the stressors of incarceration and a discussion of assessments and measurement of variables significant to the conceptualization of the developing *Rediscovery of Self-care Model (RSC)* emerges. This paper organizes *key constructs in a matrix* to facilitate an examination of the variables contributing to the vulnerability-stress model and examines how one might select variables to be applied to this population. As each section of the matrix is examined, research measures and clinical assessment instruments are discussed. Practical recommendations for clinical assessment and clinical case management are reserved for the third paper in the series along with the final RSC model.

Introduction

According to a recent Bureau of Justice Statistics report on the topic (BJS, 2006), 56% of all state correctional prison and jail inmates exhibit either a history of diagnosed mental illness or symptoms of mental illness. It is likely that this is a conservative estimate, given that the brief screens used to detect mental illness following arrest fail to detect mental illness up to 63% of the time (Steadman, Scott, Osher, Agnese, & Robbins, 2005). Experts also believe that the number of persons with mental illness (PMI) who enter the prison system is growing. The criminalization of PMI is attributable in large part to long-standing underinvestment by states in community mental health. Publicly financed mental health systems are, as Fellner (2006) notes, “fragmented, chronically under-funded, and rife with barriers to access.” As a result, “too many people who need publicly financed mental health services cannot obtain them until they are in an acute psychotic state and are found to be a danger to themselves or others (p. 393).”

In response to the steady influx of PMI, mental health diversion programs have been set up in many jurisdictions throughout the country with the aim of placing PMI under alternative forms of community supervision; this may occur post-booking and may carry the stipulation that they plead guilty to criminal charges. Some studies appear to show that persons who complete diversion programs commit new offenses at a lower rate than persons who do not complete the process (e.g., McNiel & Binder, 2007). However, these data should be viewed cautiously when comparisons are made between PMI who are deemed eligible for diversion programs and those who are not. Typically, offenders are considered eligible if they are only guilty of misdemeanors and deemed to present a low risk to public safety (Lim & Day, 2013); hence, selection bias presents a threat to the validity of research findings.

In addition, experts have noted that these programs may produce unintended effects. If persons who complete the program are given priority for community mental health beds, fewer beds will be available for PMI who are not involved (or not yet involved) in the criminal justice system. As already noted, many socio-economically disadvantaged PMI lack access to timely mental health treatment. If the criminal justice system becomes a “gateway” to mental health services, larger numbers of mentally ill persons will face the added stigma of having a criminal record (Christy, Poythress, Boothroyd, Petrila, & Mehra, 2005).

There are also concerns about the appropriateness of the community mental health programming that is offered. According to a review of the literature by Barrenger and Draine (2013), “Interventions for persons with [serious mental illness] ... involved in the criminal justice system have produced mixed results and have overwhelmingly focused on the individual-level factors that pose risks for reincarceration, primarily focusing on linking individuals to existing mental health treatment without addressing social welfare needs such as housing and income.” Yet, conditions such as homelessness and social marginalization “exacerbate mental illness or increase the risk of criminal offending or contact with the criminal justice system (p. 157).”

Currently, the complex interactions among mental illness, social disadvantage, and exposure to adverse correctional and community environments is under-theorized and understudied (Skeem, Manchak, & Peterson, 2011). A demonstrable need exists to strengthen mental health services provided in correctional environments (Knoll, 2006). At the same time, literature identifying effective correctional mental health treatment approaches is sparse. This gap is even more marked when seeking guidance to improve nursing practice and develop realistic benchmarks for nursing performance in correctional facilities.

The focus of this paper expands the general principles of a biopsychosocial vulnerability stress model noted in our first paper and is applied to corrections-involved persons, in particular, those with mental illness are focused upon. Consideration of correctional environmental factors and social determinants upon correctional health outcomes are explored for their contribution to the developing RSC model. Specific attention is given to the implications and applications of this model for correctional healthcare.

Incarcerated Persons as Vulnerable Populations

Vulnerable populations are those who are at risk of poor physical, psychological and, or social health outcomes (Rogers, 1997). Some groups of people carry a higher risk of poor health outcomes as a result of these risk factors, including the homeless, the poor, or the chronically ill and disabled, people with AIDS, people who live in abusing families, pregnant adolescents and their infants, frail elderly people, immigrants and refugees, and those who are mentally ill (Chin, 2005; Rogers, 1997). There is an overlap in the characteristics of these groups and of the individuals who are incarcerated (Williams, 2007; Hatton, Kleffel, Fisher, 2006; Hammett, 2005; Desai, Lam, & Rosenheck, 2000). Similarities in the populations include the consequences of the burdens associated with frequent generational patterns of poor health, multiple chronic stressors and health disparities.

Of the nearly 2.2 million men and women incarcerated in prisons and jails in the United States (Harrison & Beck, 2006); a disproportionate number enter the criminal justice system infected with HIV/AIDS, hepatitis, or tuberculosis. Many live with chronic conditions such as diabetes and hypertension (Maruschak & Berzofsky, 2015); and many have poor oral health, dental cavities, and gum disease (Walsh, Tickle, Milsom, Buchanan, & Zoitopoulos, 2008). The proportion who suffers from substance abuse

problems is many times higher in the prison population than in community samples. In a systematic review of the research Fazel, Bains, and Doll (2006), found that inmates with alcohol abuse and dependence ranged from 18 to 30% for males and 10-24% for females. Drug abuse and dependence were associated with 10-48% of male prisoners and 30-60% of female prisoners. However, fewer than one in four incarcerated adults with psychiatric disorders is identified in routine entry screening (Jordan, Federman, Burns, Schlenger, Fairbank, Caddell, 2002; Parsons, Walker, & Grubin, 2001; Teplin, Abram, & McLelland, 1997), and few jailed individuals with mental illness are likely to receive mental health services (Trestman, Ford, Zhang, Wiesbrock, 2007). Taken as a group, prisoners are more likely to suffer serious illness and premature death (Binswanger, Sterns, Deyo, Heagerty, Cheadle, Elmore, Koepsell, 2007; Kim, Ting, Puisis, Rodriguez, Benson, Mennella, & Davis, 2007).

These risks are compounded by the many systemic barriers to receiving needed health services once they are released (Freudenberg, Daniels, Crum, Perkins, Richie, 2005). Once released, many former prisoners have no access to health insurance and thus no entrée to health services (Shelton, Goodrich, Garcia, Filimon, Ehret, Kapetanovic, 2014). These individuals often return to the communities that are already poor, overburdened, and with limited health resources (Williams, 2007). The effect is to exacerbate health disparities already present. The inability to secure or maintain a job because of criminal history and health issues may set in motion a sequence of events that leads back to prison. Unable to find employment, get housing, pay for medication, and reestablish family and community relationships, an individual may make poor choices that lead to confinement, thus perpetuating a vicious cycle of incarceration and release.

Health Disparities

Incarceration disproportionately impacts minority communities and incarcerated populations with the vast majority of incarcerated persons returning to the community at some point. In the year 2014 alone, 583,891 persons were released from state and federal facilities (Carson, 2015). In the U.S., problem of health disparities has rightfully received considerable attention from public health experts. Traditionally, the problem has been framed in terms of the impact of poverty, gender, and racial/ethnic minority status on lifestyle health behavior, health literacy, access to healthcare, and quality of healthcare. Rarely do review articles devoted to the topic of health disparities mention the role of incarceration.

To provide one example of the impact of mass incarceration to the problem of health disparities, the observed racial disparity in HIV infection rates among African American women is almost entirely explained by the high incarceration rate of African American men. The removal of males from the community disrupts stable partnerships and creates strong social and economic pressure for women to seek out concurrent sexual relationships. This, in turn, leads to HIV risk behavior (Johnson & Raphael, 2009).

To fully appreciate the scope and scale of the impact of mass incarceration on the black community, one must take note of the cumulative impact of the so-called "War on Drugs" that was first launched in the 1960s and reinvigorated during the Clinton administration (Alexander, 2011). In brief, even though blacks as a group are no more likely to be drug users than whites, their drug use is far more likely to be detected by police and more likely to lead to arrest (Gelman, Fagan & Kiss, 2007; Ridgeway & MacDonald, 2009). The drug-related incarceration rate of black adults is 256.2 per 100,000 as compared to 25.3 per 100,000 for white adults -- a tenfold difference (Fellner, 2009). Roughly 1 out of 9 black men between the ages of 20 and 34 is incarcerated at a given point in time (Pew, 2008).

The effects of mass incarceration on health disparities are evident for other illnesses as well. According to one study, 40% of all persons in the U.S. who are infected with tuberculosis had a history of incarceration (Hammett, Harmon, & Rhodes, 2002). Hypertension is also more prevalent among incarcerated versus community dwelling non-Hispanic blacks (absolute difference: 13.6%; relative difference 49.1%; CDC, 2013). Incarceration then, even after controlling for socioeconomic status, obesity, and other correlates, is a risk factor for hypertension; this presumably owes to the high stress nature of the carceral environment, and its effect on the dysregulation of stress hormones (Wang, Pletcher, Lin, Vittinghoff, Kertesz, Kiefe et al., 2009).

With such evidence, mass incarceration rarely figures in discussions of the problem of health disparities in the U.S., even though incarcerated persons are drawn disproportionately from low-income, predominantly non-white, medically underserved communities (Dumont, Brockmann, Dickman, Alexander & Rich, 2012). Dumont and colleagues argue that recognizing the role of mass incarceration in promulgating health disparities points to opportunities to launch high-impact public health interventions targeting most-at-need groups.

Review of Biopsychosocial Vulnerability Stress Models in Corrections

Limited studies were available for review to examine how the vulnerability-stress model in total might be applied to this population and variables one might select for use in the model. In a study of the first 30 days of incarceration, Harding & Zimmermann (1989) examined cognitive stress and vulnerability factors among 208 male inmates in Britain. Three kinds of vulnerability in this sample were noted: life experiences, personality and medical history. Life experiences included the experience of numerous

negative life events, an unhappy childhood, and early separation from parents. The authors included a measure of recidivism, employment preceding incarceration, current education level, and current personal relationships or social supports. Pathology of the personality was evaluated using the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1981) and classified as normal, neurotic traits without character disorder, neurotic traits with character disorder, or severe personality disorder. Self-esteem was also measured. Lastly, medical history was collected through self-report, limited to the presence of prior psychiatric problems, regular use of medication, and drug and alcohol abuse. The authors reported that entry into prison was perceived as a serious stressor, and one that is more problematic for those individuals with psychiatric disorders as well as for those who had a close female relationships before imprisonment (in normal circumstances such relationships would be protective). Stress is not only related to the prison environment but also to the legal process and may be a disruption of the inmate's social network. The degree to which incarceration acts as a stressor, or disrupts one's social network must be considered within the context of culture as noted in the "incarceration as rites of passage" literature (Lichtenstein, 2009; Ogilvie & Van Zyl, 2001; Denny, 1995).

A study by Bonner (2006) examined psychosocial vulnerability among 134 male inmates who were suicidal and the effects of segregation housing, or solitary confinement. Segregated housing has been identified as a major risk factor for prisoner suicide secondary to conditions that are considered highly aversive and stressful, leading to desperation and isolation panic (Toch, 1992) and morbid thinking. In Bonner's study, inmate vulnerability factors under investigation included mental health problem history, suicide attempt lethality history, hopelessness, and reasons for living. As hypothesized, this author found

that inmates in segregation had higher levels of depression and suicide ideation than in the general prison population, but that they did not differ on hopelessness, histories of mental health problems or suicide attempt lethality. Vulnerable inmates with greater mental health problems, higher suicide attempt lethality, and higher levels of hopelessness were more likely to report suicide intention than inmates who did not perceive segregation as stressful.

In conceptualizing the correctional population as a clinical population, experiencing a high burden of chronic health problems and health disparities, we see that they have many overlapping health and social concerns with other vulnerable populations. This knowledge is critical to the translation of the expanded diathesis-stress model in its application to persons in correctional environments.

Incarceration-Related Stress

Before considering the unique stressors faced by the corrections-involved PMI, it is important to examine the effect of an increased risk of experiencing a “revolving door” of repeated arrests and convictions stemming from low-level felony, misdemeanor, or disorderly conduct arrests and parole revocation (c.f., Canada & Watson, 2013). In some instances, these are survival crimes, or can be considered ineffective coping strategies. For example, shoplifting, trespass, or “dine and dash” (eating at a restaurant without paying the bill) may stem from homelessness and low employability. More commonly, offenses committed by PMI are attributable to instances of reactive aggression in response to provocations (Peterson, Skeem, Hart, Vidal, & Keith, 2010). The inmate’s experience of the “revolving door” contributes to the cycle of increased stress.

Increased stress is linked in part to the risk of physical and sexual assault during periods of incarceration. Incarcerated males who have mental illness are 1.6 times more likely, and incarcerated females with mental illness are 1.7 times more likely to be physically assaulted by other inmates; and, female inmates are also more likely to be physically assaulted by prison staff (Blitz, Wolff, & Shi, 2008). Further, in a study of the Texas prison system, PMI were found to be 8 times more likely than other inmates to be victims of sexual assault (Austin, Fabelo, Gunter & McGinnis, 2006). Limitations in coping ability secondary to their mental illness puts these individuals at greater risk and in need of protection within this environment. Often times this results in an increased use of restrictive environments, which are known to cause more stress and increase psychotic symptoms (Hills, Seigfried & Ickowitz, 2004). These risks continue into the post incarceration phase, where behaviors have remained unchanged, support systems further eroded, and stress has increased.

Denial of Positively Valued Goals. What makes this application unique is consideration of the highly stressful effects of the day-to-day experience of incarceration. Blevins, Listwan, Cullen, & Jonson (2010), using General Strain Theory as a framework, identify broad categories of incarceration-related stressors. Denial of positively valued goals is the first of these, and is defined as the experience of disjuncture between expected and actual outcomes and violations of the expectation of fair treatment. Correctional officers provide inmates with rewards for good behavior (e.g., special privileges) and punishments (e.g., documented infractions) for misbehavior. The likelihood that an inmate will earn privileges and avoid infractions depends in part on his or her ability to inhibit inappropriate behavior and follow instructions, which may be challenging for PMI (c.f., Fellner, 2006). An inmate who recognizes that emotional outbursts

are problematic may seek out facility-based programs dealing with issues such as anger management, only to discover that a record of infractions renders him or her ineligible to participate (P. Hynes, personal communication, 7/31/2015).

Removal of Positively Valued Stimuli. The second category of stressor identified in Blevins et al. is the removal of positively valued stimuli. Examples include the experience of autonomy, privacy, freedom of movement, and the ability to interact freely with friends and family. The extent of the deprivation of these stimuli can hardly be appreciated unless one has spent time in a correctional facility.

Perceived autonomy and social interaction are not merely “valued stimuli” but are important buffers against stress. An extensive literature in organizational psychology has shown that employees are able to overcome the stress of having a highly physically and emotionally demanding job if they perceive themselves as autonomous rather than controlled, and can avail themselves of social support (e.g., Bakker & Demerouti, 2007). From the standpoint of mental health, providing individuals with autonomy support and access to social networks are decisive factors in promoting successful recovery from mental illness (Drake & Whitley, 2014; Schön, Denhov, & Topor, 2009).

Exposure to Noxious Stimuli. The third broad category of incarceration-related stressor is exposure to noxious stimuli, such as noise, crowding, personal victimization, and witnessing the victimization of other inmates. Exposure to noise and crowding activates the hypothalamic-pituitary-adrenocortical (HPA) axis (Evans & Kim, 2007), which, as will be discussed, is involved in the physiological response to stress. Social isolation (Cacioppo & Hawkley, 2003) and sensory deprivation (Wade, Hankins, Smyth, Rhone, Mythen, Howell et al., 2014) are major stressors, with the latter known to be associated with increased risk of

experiencing hallucinations and delusions. PMI are placed in administrative segregation or “solitary confinement” more frequently than other inmates (Knoll, 2006; Testa, 2015). Being subjected to administrative segregation has been shown to produce clinical symptoms of depression and anxiety among persons who did not previously exhibit these symptoms (Andersen, Sestoft, Lillebaek, Gabrielsen, Hemmingsen, & Kramp, 2000). Psychiatric illness and exposure to administrative segregation are risk factors for suicide, with suicide being the 3rd leading cause of death in U.S. correctional facilities (Patterson & Hughes, 2008).

Application of VSM Model to Criminal Justice Populations

Social factors create socioeconomic (SES) inequality and resultant disparities in the incidence and prevalence of physical and psychiatric illness. The same social factors contribute to community-level variation in criminal activity. The result is a concentration of physical and psychiatric illness in correctional populations.

Common Factors for Crime and Poor Health

According to several leading theories in the field of criminology, cognitive deficits, low self-control, and negative emotionality (neuroticism) are important predictors of criminal propensity (Savolainen, Paananen, Merikukka, Aaltonen, & Gissler, 2013). These three factors also loom large in empirical studies of the determinants of premature mortality and morbidity. To put this in perspective, Lee and Paxman (1997) showed that roughly half of all preventable deaths result from behavior and lifestyle choices such as “tobacco use, sexual behavior, eating habits, sedentary life style, use of alcohol and other drugs, violent and abusive behavior, and other risk-taking behaviors that lead to injury” (p. 17).

Numerous studies in the field of public health and related disciplines have shown that neuroticism is an important predictor of physical and psychiatric illness. It is a vulnerability factor for psychological disorders, increases reactivity to stressors, and predisposes individuals to engage in unhealthy behavior (c.f., Feltman, Robinson & Ode, 2009; Lahey, 2009).

Persons who score in neuroticism often – but not invariably – score in measures of impulsivity. One of the distinguishing features of impulsivity is low self-control and as Savolainen note, this variable has garnered considerable interest among investigators seeking to identify personality correlates of criminal activity. At the same time, impulsivity is of interest to investigators who study risk-taking and other forms of health-compromising behavior (c.f., Cooper, Agocha, & Sheldon, 2000). Certain behaviors that are linked to impulsivity – for example: illicit substance use, interpersonal violence, reckless driving, and impaired driving – are equally of interest to both criminologists and health psychologists.

It is essential to recognize that the impact of these personality variables on life-course trajectories is influenced by SES. Persons with low SES families of origin are less likely to achieve higher SES later in life if they exhibit neuroticism (Jonassaint, Siegler, Barefoot, Edwards, & Williams, 2013). The widely-observed association between impulsivity and antisocial behavior is of significantly greater magnitude in low SES communities as compared to more affluent communities (Lynam, Caspi, Moffitt, Wikström, Loeber et al., 2000). Lee and Paxman observed that behavioral and lifestyle risk factors for early mortality and morbidity are highly concentrated in “communities where poverty rates are high, housing is inadequate, educational services are inadequate, social support services are inadequate, and jobs are not available” (p. 17).

Thus far, attention has not been given to the third key predictor of criminal propensity (Savolainen et al, 2013), namely, cognitive deficits. These are also associated with unhealthy behavior and exacerbate the effects of low SES on health-related outcomes (Grossman, 2006; Rindermann & Meisenberg, 2009). This will be discussed at further length in connection with intelligence and educational attainment.

First, a focus on social determinants of inequality will be considered because of the impact upon the relationship between criminological and health outcomes. Diderichsen, Evans and Whitehead (2001) arrayed social determinants into four broad categories. These are (1) social stratification, (2) differential exposure to hazards, (3) differential vulnerability, and (4) differential consequences. Each of these mechanisms will be explained below.

Social Stratification.

Social stratification refers to multiple processes by which individuals are assigned to different social positions, as it bears on wealth, status, and access to resources. Diderichsen and colleagues note that “a person from a minority ethnic group may be more likely to have, on average, lower educational attainment, fewer employment opportunities, and less income than a person of the majority ethnic group. In the United States this process has resulted in the concentration of African Americans in urban neighborhoods with high levels of poverty and little opportunity (either educational or employment, p. 16).

Racialized Mass Incarceration. Historically, the literature on social stratification has neglected the role of incarceration. In recent years experts have come to regard incarceration as (1) an important driver of social inequality, (2) operating on a massive scale, and (3) disproportionately impacting the life prospects of racial and ethnic minority communities (Wakefield & Uggen, 2010).

As we have discussed, bias against African Americans is perhaps most conspicuous in terms of criminal justice outcomes with respect to minor drug offenses. At low to moderate levels, removal rate (community-level arrests and convictions) reduces neighborhood crime, but high removal rates are associated with increased community disorganization and increased crime (Clear, Rose, Waring & Scully, 2003). In communities that are home to large numbers of formerly incarcerated persons, policing practices are more aggressive, leading to strained relations between the police and community members and the stigmatization of law-abiding community members (Fagan, West, & Holland, 2003). Women who are economically dependent on men who are incarcerated will subsequently face an increased risk of eviction and, in turn, a deteriorating standard of living (Desmond, 2012). Or, as noted previously, shift in some cases to minor survival crimes (prostitution, sale of drugs) adding to the downward spiral of the community and direct negative impact upon their children.

Differential Exposure

Differential exposure refers to the varied consequences of stratification, such as neighborhood environment, the quality of local schools, and so on. Evans and Kim (2013), in a review, report that low socioeconomic status (SES) children are exposed to numerous social and physical stressors. In terms of family environment, they are more likely to face “family conflict and turmoil, family dissolution, maternal depression ... as well as elevated parental harshness and diminished parental responsiveness.” In terms of residential environment, they are “more likely to live in homes that are more chaotic, with greater structural problems, noise, crowding, toxins, and allergens” (p. 44).

Evans and Kim further note that the cumulative impact of these varied stressors mediates the link between poverty and chronic physiological stress and contributes to increased aggression, anxiety, and depression. Childhood family poverty and childhood neighborhood poverty each predict a higher incidence of childhood neglect, PTSD, major depressive disorder, and criminal activity (Nikulina, Widom, & Czaja, 2011).

Poverty and Mental Illness. A substantial international body of evidence indicates that “mental ill-health and poverty interact in a negative cycle. This cycle increases the risk of mental illness among people who live in poverty and increases the likelihood that those living with mental illness will drift into or remain in poverty” (Lund, De Silva, Plagerson, Cooper, Chisholm et al., 2011; p. 1502). Persons with mental illness encounter problems such as unemployment, homelessness, and criminal justice system involvement more frequently than other individuals, “because they live in a world in which these problems are endemic, not just because they are mentally ill” (Draine, Salzer, Culhane, & Hadley, 2002; p. 565).

Education and Intelligence. In health disparities research, educational attainment is sometimes used as an indicator of SES. However, it is important to note that the effects of limited formal education on health-related outcomes are more pronounced than the effects of low income (Herd, Goesling, & House, 2007). Also, it is unclear *how* education improves health; education might exert this effect by increasing income and social status, by conferring non-cognitive skills acquired in the educational system such as perseverance and increased perceptions of personal control, or by conferring specific knowledge in the areas of health literacy and knowledge (Cohen & Syme, 2013). Low educational attainment may in some cases be attributable to undiagnosed mental health problems such as ADHD (Asherson et al., 2013). It is also important to note

that, although educational attainment and intelligence are associated with one another, they are not the same thing.

Historically, researchers have questioned whether intelligence (as measured by an IQ test) is an inherited trait that is insusceptible to environmental influence or is modifiable through education, but recent data suggests that schooling provided to adolescents does increase intelligence (Brinch & Galloway, 2011). Low parental SES may affect intelligence indirectly through infant malnutrition (Isaacs, Gadian, Sabatini, Chong, Quinn et al., 2008), risk of preterm delivery (Pickett, Ahern, Selvin & Abrams, 2002), low birth weight (Lahat, Van Lieshout, Saigal, Boyle & Schmidt, 2015), exposure to environmental pollution (Perera, Weiland, Neidell & Wang, 2014), maternal alcohol or tobacco use (Jacobson, Jacobson, Sokol, Chiodo & Corobana, 2004), and exposure to either an enriched or impoverished stimulus environment (Gottlieb & Blair, 2004), among other factors.

A longitudinal study of 422 male youth has shown that low intelligence, even after controlling for race and SES is predictive of delinquent behavior among youth and criminal offenses among adults (Loeber, Menting, Lynam, Moffitt, Stouthamer-Loeber et al., 2012). In considering why intelligence might predict criminal activity, low intelligence is specifically associated with a facet of executive function involved in updating working memory (i.e., preserving task-relevant information when distracted), a function that is closely linked to self-regulation (Friedman, Miyake, Corley, Young, DeFries et al., 2006). This may shed light on the observed association between low IQ and impulsive physical aggression among adolescents with conduct disorder (Barker, Vitaro, Lacourse, Fontaine, Carbonneau et al., 2010).

Differential Vulnerability

Evans and Kim (2013) observe that, according to parent and teacher ratings, low SES children are more likely to struggle with delay of gratification, attentional control, and working memory capacity. Adults living in poverty experience similar handicaps. In a provocative thesis, researchers have suggested that the demands of poverty – securing income and housing, working irregular shifts, contending with the threat of crime, living in crowded conditions and so on – deplete finite cognitive resources and in turn increase the rate of self-regulatory failures. The consequences of self-regulatory failure are themselves stressful – consider, for example, the consequences of failing to practice preventive health care, low adherence to treatment regimens, missed medical appointments, inattentive parenting, and poor financial management (Mani, Mullainathan, Shafir & Zhao, 2013). Stress magnifies the salience of proximal rewards (which may include cigarettes, alcohol, or unhealthy food choices) and it also magnifies the salience of minor hassles (as it relates to health, hassles include adhering to medications, keeping appointments, or exercising restraint over situational temptation; c.f., Dang, Xiao, & Dewitte, 2015).

Differential Vulnerability of African Americans. Even when controlling for SES, African Americans tend to exhibit higher allostatic load (based on a measure of 10 biomarkers) than whites (Geronimus, Hicken, Keene, & Bound, 2006). Geronimus et al. speculate that this is attributable to racial discrimination. However, “racial discrimination” is a broad construct and takes in proximal variables such as personal exposure to prejudice as well as distal variables such as social inequality.

One potential mechanism linking African American status to allostatic load is birth outcome. African Americans are significantly more likely than members of other racial / ethnic groups to bear low birthweight offspring. Stress, poverty and neighborhood segregation increase the risk of low birthweight offspring (Grady, 2006). Low birthweight children, in turn, exhibit characteristic problems of HPA axis over-reactivity and hypercortisolism (Rondó, Ferreira, Nogueira, Ribeiro, Lobert et al., 2003).

Also, Geronimus et al. did not consider whether incarceration history might account in part for the higher allostatic load of African Americans. Yet, “incarceration has become pervasive among recent cohorts of low-educated black men. With lifetime risks of imprisonment of around 70%, the added risks of jail incarceration, probation, criminal conviction, and arrest would make criminal justice involvement nearly universal for this group” (Western & Muller, 2013; p. 183).

The effects of allostatic load on stress-related illness is moderated by perceived control, such that persons living in a low SES environment but report high perceived control are no more subject to stress-related physical illness than their high SES counterparts (Hatch, 2005). Incarceration, re-incarceration, the experience of post-release supervision under parole or probation, and restrictions on employment and housing among persons with a criminal history each have profound impacts on perceived and actual personal autonomy and control (Massoglia, 2008; Purtle, 2013).

Differential Consequences

Didrichsen et al. (2001) argues that, among those who experience adverse health outcomes, members of low SES groups face more severe challenges in terms of access to and affordability of medical treatment, ability to adhere to treatment, and the economic consequences of disability. Speaking to this point, persons

of low SES are less likely than more affluent individuals to get paid time off from work to visit a provider. They may also face difficulties finding *Medicaid*-approved providers who are accepting new patients, particularly in neighborhoods where *Medicaid*-approved providers are in high demand. And despite the *Patient Protection and Affordable Care Act*, many remain uninsured (Price, Khubchandani, McKinney, & Braun, 2013). Persons with chronic illness also face challenges finding employment opportunities and retaining their jobs (Boyd & Fortin, 2010) due to burdens associated with their chronic diseases.

The problem of differential consequences is also evident when one considers the influence of the physical and social environment on addiction and relapse. Persons whose socioeconomic circumstances compel them to return to distressed communities where their addiction may have originally begun and where drugs may be readily available are at increased risk of relapse (Wooditch, Lawton, & Taxman, 2013). Persons with mental illness (PMI) who also have a history of substance use, particularly in low-SES communities, are targeted by drug dealers who recognize their vulnerability (Drake, Wallach, & McGovern, 2014).

Mandated Inequality. Persons with a criminal history by law lose certain civil rights, parental rights, public benefits, and employment and housing opportunities (Chin, 2012). Chin (2012) notes that the *Supreme Court* has increasingly recognized that so-called “collateral consequences” of incarceration constitute a form of punishment which many criminal defendants fail to anticipate when they are sentenced to a prison term, and which severely limit the individual’s life prospects. Yet, this problem has yet to be systematically addressed by the legal system. The link to health and wellness is evident in consideration of the aforementioned discussion.

Overview of the VSM Matrix and Interaction Effects

As supported by the constructs, mediators and moderators generated from our review of basic principles, advances in theory, and research relating to vulnerability and stress models in the first article of this three-article series. We now present a matrix (Table 1) incorporating social determinants of physical and psychiatric illness and criminal justice involvement. In this section, attention will turn to the challenges of applying these findings to individuals with a history of incarceration and psychiatric illness. Topics will include the experience of prisonization, familial and social consequences of incarceration, the use of administrative data in case formulation, and the selection of appropriate assessment tools for measurement as we move toward a research sensitive and clinically understood model.

Table 1. Matrix of Vulnerability and Stress Factors associated with an Incarceration Experience

	Biological Domain	Psychological Domain	Social Domain
Individual Vulnerability Factors	Genetic predisposition to mental illness, substance use, physical illness (<i>indicated by clinical case history and family history</i>)	Early life adaptations to trauma and conflict	Chaotic family environment; residential instability; violence & victimization
	Intellectual disability owing to genetic, epigenetic/prenatal exposures and early life exposure to lead and other toxins	Low self-efficacy with respect to ability to follow medical advice or understand providers' instructions	Exposure to antisocial peers and drug use
	Acquired reactivity to stressors (i.e., changes in the HPA Axis)	Social modeling of maladaptive coping strategies; anxiety sensitivity; distress intolerance	Low academic attainment; non-attainment of cognitive & non-cognitive benefits of education
	Physiologic effects of noise and unstable living conditions on allostatic load and associated adaptations	Prisonization: Adaptation to prison conditions in relation to de-skilling (<i>dependence, hypervigilance, emotional over-control, social withdrawal, exploitive norms, internalized stigma</i>) and infantilization (<i>over control of behavior exerted by correctional staff</i>)	Post-release preservation of prisonization adaptations impacts re-entry success and ability for self-care management
		Low perceived competence, arising from observation of consequences of one's own impulsive behavior	Marginalization: social stigma; cumulative burden; poor reintegration supports
Environmental Stress Factors	Presence, in environment, of toxins such as lead; unhygienic residences; noise; crowding	Environmentally-contingent modeling and reinforcement of psychological and behavioral patterns established during early life history	Neighborhood-level limited access to quality schools and preventive/diagnostic health care
		Denial of autonomy, crowding, low control; risk of violence & victimization	Low availability of vocational training and job opportunities
			Housing/income insecurity; density; risk of violence & victimization
			Paternalistic treatment by service providers, reinforcing low perceived competence

Prisonization

The term “prisonization,” is noted in the center of the matrix for its significance to our conceptualization of the RSC model. Prisonization refers to “the taking on” by inmates, “in greater or lesser degree, the folkways, mores, customs, and general culture of the penitentiary (Clemmer, 1940; p. 270)” resulting in the formation or deepening of criminal thinking patterns and antisociality. Clemmer implicated both the processes by which a new inmate will come to adopt the values of fellow inmates and the perverse effects of the institutional environment on increased dependency. In practice, the term “prisonization” has been used loosely to reflect characteristic incarceration-related changes in attitudes and behavior. Clemmer’s deviant socialization hypothesis has been supplemented by other accounts, and the more prominent of these will be summarized below.

Deviant Socialization Model. Recidivism rates among low-risk offenders (i.e., those with relatively short criminal histories or less serious criminal offenses) tend to be higher if, during their time in prison, they are placed together with high-risk offenders (Pritikin, 2008). Persons who find themselves interacting with violent and coercive peers learn that it is necessary to project a persona of toughness and retaliate violently to minor social transgressions if they are to avoid becoming victimized (Berg, Stewart, Schreck & Simons, 2012). In a large-scale study of persons incarcerated in Britain and Wales, a quarter of all heroin users reported that their drug use first started in prison (Boys, Farrell, Bebbington, Brugha, Coid et al., 2002).

Deprivation Model. Sykes (1958) asserted that, because incarceration deprives inmates of personal security, autonomy and other basic needs, inmates will devise strategies to mitigate these losses. So, for example, inmates form gangs for the sake of mutual protection. This model has less empirical support than the other models discussed here, partly because of methodological difficulties. In weighing the relative merits of the deprivation and deviant socialization model, gang membership could be counted in support of either model, and it is a matter whether the behavior is framed in terms of deviance or in terms of collective action. Efforts to test the deprivation model by considering variables such as perceived prison conditions in relation to disciplinary infractions (e.g., Hochstetler & DeLisi, 2005) do not address Sykes' premise that inmate misconduct may be understood as either adaptive or functional responses to conditions of confinement.

Importation Model. According to this model, antisocial behavior is present among inmates prior to their entering correctional facilities. Evidence suggests that persons who belong to gangs prior to incarceration remain in the same gangs or join new gangs while incarcerated (DeLisi, Berg, & Hochstetler, 2004). There is no question that "prisonization" is attributable in part to pre-existing behavioral problems among members of the correctional population; however, the importation model is severely limited by the omission of social and physical environmental variables.

Institutionalism Model. We agree with Clemmer who notes that the prison environment fosters dependency among inmates. The phenomenon of "institutional syndrome" or institutionalism was widely observed among residents of public psychiatric institutions prior to the de-institutionalization movement and helped inspire that movement. It is distinguished by, "apathy, lethargy, passivity, and the muting of

self-initiative; compliance and submissiveness; dependence on institutional structure and contingencies; social withdrawal and isolation; an internalization of the norms of institutional culture; and a diminished sense of self-worth and personal value” (Johnson & Rhodes, 2007; p. 228). As it bears on prison inmates, Haney (2001) observes:

Correctional institutions force inmates to adapt to an elaborate network of typically very clear boundaries and limits, the consequences for whose violation can be swift and severe. Prisons impose careful and continuous surveillance, and are quick to punish (and sometimes to punish severely) infractions of the limiting rules. The process of institutionalization in correctional settings may surround inmates so thoroughly with external limits, immerse them so deeply in a network of rules and regulations, and accustom them so completely to such highly visible systems of constraint that internal controls atrophy or, in the case of especially young inmates, fail to develop altogether. Thus, institutionalization or prisonization renders some people so dependent on external constraints that they gradually lose the capacity to rely on internal organization and self-imposed personal limits to guide their actions and restrain their conduct. If and when this external structure is taken away, severely institutionalized persons may find that they no longer know how to do things on their own, or how to refrain from doing those things that are ultimately harmful or self-destructive (n.p).

Coping Model. Also central to the developing model are an inmate’s ability for coping and adaptation.

According to Toch (1985) correctional environments, by their very nature, “tax coping competence” (p. 66), particularly for persons with a history of mental illness. He observes that the psychologically vulnerable person is surrounded by dangerous and unpredictable individuals, exposed to noise and over-stimulation alternating with periods of under-stimulation, and has only very restricted contact with family members. Apart from acute psychopathological episodes, frequent episodes of primitive or maladaptive coping responses manifest among inmates, particularly among PMI. For example, non-suicidal self-injury occurs among 48% of incarcerated persons and 61% of incarcerated PMI; this vastly exceeds the rate observed in the general population (4%; Dixon-Gordon, Harrison & Roesch, 2012).

Cnaan, Draine, Frazier & Sinha (2008) believe that the predominant coping strategy employed by inmates is apathy. Apathy has been defined as the absence of or severe reduction in self-initiated action, and manifests in part as loss of interest in pleasurable activities, lack of insight, impaired cognitive function, low participation in the activities of daily living (e.g., maintaining hygiene, nutrition, and so on), and low treatment or medication adherence. Given this description, apathy may be understood as a dissociative avoidant emotional regulation strategy. Apathy is only moderately correlated with symptoms of depression (van Reekum, Stuss & Ostranger, 2005). In this respect, we believe it is important to note that the coping and institutionalism models overlap in that both implicate apathy as a key dimension of prisonization.

Expanded Coping Model. To more fully specify the social environment within prisons as it contributes to the inmate's coping responses and in turn is a distinctive prisonization phenomenon, one may consider the coping responses of correctional staff members. The prison environment is stressful not only for inmates but for staff members as well. As illustrated by the Stanford Prison Experiment of the 1970s (c.f., Zimbardo, 2004), persons who are placed in role of Correction Officer (CO) to monitor the environment for threats against themselves and experience fears of insurrection and retaliation by prisoners. Inmates who are not compliant with prison rules may be singled out for persecution by correctional officers or subjected to harsh physical abuse (Haney, 2008).

This, in turn, gives rise to problematic patterns of interpersonal behavior. Excessive help-seeking or attention-seeking behaviors by inmates are sometimes perceived as "manipulative" or "needy" by correctional staff members, and this contributes to occupational stress (Bowers, 2003). Moreover, the experience of working in correctional settings is rife with contradiction. On one hand, there is an

expectation that staff members remain vigilant to potentially dangerous interactions with inmates, and exercise authority and emotional detachment at all times. On the other hand, there is an expectation that staff members participate in the process of inmate rehabilitation, act as positive role models, and offer appropriate support and guidance. The "double binds" encountered by people who work in corrections may sometimes result in their withdrawing entirely from the challenges and treating inmates in a depersonalized manner, or may result in heightened stress among personnel who are continuously engaged in negotiating these ambiguities (Tracy, 2004). Nurses and other staff members have described a "circle of stress" in correctional environments "whereby low morale and staff shortages increased stress levels, which in turn increased staff sickness rates, reduced staffing levels, further lowered the morale of remaining staff and led to more stress and staff sickness" (Nurse, Woodstock & Ormsby, 2003; p. 3). Staff member stress will likely affect their interactions with inmates, and the effects of these strained interactions may contribute to the elicitation of prisonized behavior.

Individual Vulnerability

Adapting the VSM framework (Wong, 2006) to persons with mental illness (PMI) and a history of incarceration, one may categorize diagnostically-relevant sources of vulnerability within biological, psychological and social domains. Literature found supporting these variables, specific to incarcerated populations when possible, is briefly discussed in the following section, and has been added to the framework. The results are portrayed in the matrix displayed in Table 1.

Biological Domain

The impact of early life exposure to stressors and changes in the HPA axis and other stress-responsive brain regions has been discussed in this issue (Shelton, Barta, Wakai & Trestman, 2016). Childhood abuse and exposure to violence and trauma are examples of stressors that have the potential to induce brain changes, particularly but not exclusively during critical periods of child development. Thus, evaluating the client's early life history may provide important clues regarding biological factors contributing to increased vulnerability to psychopathology. Factors included in the biological domain include substance use, higher order personality factors, and observable manifestations of lifetime allostatic load.

Substance Use. The risk relationship between substance use and psychiatric disorder is almost certainly reciprocal, with psychiatric disorder predicting later substance use and substance use modifying the course of psychiatric disorder. Early life stress induces long-term changes in the mesolimbic pathway (relevant to dopamine regulation), and this is believed increase individual vulnerability to and responsivity to substance use (Brady & Sinha, 2005; DeMatteo, Filone, & Davis, 2015). The disproportionate number of persons with psychiatric illness in the correctional system is almost entirely attributable to comorbidity between substance use and psychiatric illness (Wood & Wilson, 2014).

Dopamine dysregulation is implicated in psychiatric conditions ranging from depression and ADHD to schizophrenia. It is noteworthy, then, that chronic alcohol use exacerbates dopamine dysregulation (Kashem, Ahmed, Sarker, Ahmed, Hargreaves et al. 2012). In light of findings such as these, Brady and Sinha's hypothesis that substance use may be an intrinsic feature of certain psychiatric disorders – that is,

playing a key role in maintaining symptoms and working against recovery – warrants careful consideration.

According to research cited by Sandor (2009), even though measured antisocial personality disorder discriminates between persons who are alcohol dependent and those who are not, this is not true of formerly alcohol dependent persons who have been abstinent for at least 5 years.

In a vulnerability stress model, a history of or current substance use or abuse is proposed as a biochemical source of vulnerability to acute psychiatric disorder. Substance use contributes over time to reduced coping competence and increased risk of acute and chronic psychiatric disorder; but in terms of etiology, it also bears emphasis that persons with psychiatric disorder are more likely to turn to illicit substances to “self-medicate” their emotional disorders. It is very plausible that there is a temporal, reciprocal association between psychiatric illness and substance use. National epidemiologic surveys and clinical studies consistently indicate that substance use disorders and mood and anxiety disorders have strong associations when considered on a lifetime basis (Argawal, Lynskey, Madden, Bucholz & Heath, 2006; Grant, Stinson, Dawson, Chou, Dufour, Compton, Pinkering, Kaplan, 2004; Van Valkenburg & Akiskal, 1999). Cocaine abuse and dependence are associated with increased risk for depression, particularly among persons with antisocial personality disorder (Rounsaville, 2004). Ongoing substance use may obfuscate or complicate symptomatology, contribute to treatment noncompliance, accelerated relapse, worsening psychiatric symptoms, and increase risk of suicide (DeMatteo et al., 2015, p. 333).

Temperament. Earlier, we discussed the role of temperament consisting of disinhibition, avoidance (negative affectivity), and approach (positive affectivity). Insofar as temperament is shaped by prenatal

epigenetic factors and early life experience, it is appropriate to acknowledge temperament as belonging to the biological domain.

Weathering. Early mortality and physical symptoms of accelerated aging are observed among persons in low SES communities, a phenomenon that has been described as “weathering.” The biopsychosocial and physiological aspects of this phenomenon have already been discussed (Juster, McEwen & Lupien, 2010; c.f., Geronimus, 1992). From a clinical standpoint, premature onset of age-related medical symptoms provides insight into the life history of the patient and may help inform clinical assessment.

The phenomenon of weathering is closely related to chronic stress. McEwen (1998) introduced the concept of allostasis as the adaptive stress response and distinguished allostasis as a state in which individuals meet a given challenge, in contrast to allostatic load which is an overload of their physiological functions due to a continuous activation of their adaptive coping machinery (McEwen & Wingfield, 2003). Function overload appears if allostasis mediators, such as adrenal hormones, neurotransmitters or immunocytokines, among others, are released too often or are used inefficiently; and is more likely to occur when unpredictable social stressors chronically induce physiological and behavioral adjustments that may wear down the underlying physiological functions (Bartolomucci, Palanza, Sacerdote, Panerai, Sgoifo, Dantzer, Parmigiani, 2005; Blanchard, Hebert, Sakai, McKittrick, Henrie, Yudko, McEwen, Blanchard, 1998) contributing to chronic disease. Based on contacts with incarcerated persons in a clinical context, it is not uncommon to observe symptoms that are suggestive of a weathering effect.

Clinical Assessments and Research Measurements for the Biological Domain

Incorporated into the matrix (Table 1), under the Biological Domain in the row of Individual Vulnerability Factors are variables observed in clinical practice, interdisciplinary intake assessments, system utilization review data and additional variables identified through the literature that would need to be added through targeted research and evaluation studies. These include age of onset of signs and symptoms of psychiatric disorders and high risk behaviors; a history of violence, substance abuse (including alcohol consumption), personal or family history of mental illness and hospitalizations; and a history of abuse or neglect. Information that is obtained from state criminal justice assessments includes mental health and medical needs assessment and indices utilized in determinations of level of security and housing placements. Indicators of service provision, such as clinic visits are available through utilization review. . These are of interest as inmates have limited ways in which they can demonstrate control in their environment, and utilization of health care services is one way in which this sense of control is demonstrated. What is not collected regularly is a measure of distress tolerance, which is a common construct in research on affect dysregulation (Simons & Gaher, 2005). Level of distress tolerance has been measured by how long an individual persists in a task that induces physical or psychological discomfort, providing an objectively measured outcome (Lejuez, Kahler, & Brown, 2003; Brown, Lejuez, Kahler, & Strong, 2002).

To date, Simons and Gaher's scale has only been applied to a limited extent to clinical populations; notably, evidence suggests that experience with intolerable emotional states may contribute to symptomatic behavior among persons with anxiety disorders (Keough, Riccardi, Timpano, Mitchell & Schmidt (2010). A second scale exists by the same name (Corstorphine, Mountford, Tomlinson, Waller, & Meyer, 2007); the

conceptualization of the underlying construct is similar, but this scale focuses on a different set of manifestations. Specifically, attention is given to cognitive and behavioral responses to destabilizing emotional states including anger, happiness, loneliness, anxiety, and depression. Subscales consist of "anticipate and distract," "avoidance of affect," and "accepting and managing emotion." Subsequent analysis suggests that a four-factor solution may provide a better fit, and this factor solution points to the distinctiveness of anticipating and managing loneliness as well as avoidance of positive affect (e.g., reactivity to anxious arousal states generated by becoming overly excited; Raykos, Byrne, & Watson, 2009). Raykos and colleagues found that the latter was directly associated with symptomatic episodes of eating disorder.

Distress intolerance is likely of particular importance and centrality in understanding a client's vulnerability to episodic affect dysregulation and the attending risk of harmful consequences to him- or herself and others. It should be borne in mind that traditional self-report measures of this construct tap a trait-like propensity to exhibit a given level of distress (in)tolerance. It remains unclear whether – or to what extent – one or both of these measures of distress tolerance may possess clinical predictive utility.

Psychological Domain

The elements of the biological domain outlined above provide a very general sense of the individual's vulnerabilities. However, individuals differ with respect to their resilience to adverse outcomes even at high levels of vulnerability. Also, one may expect there to be individual differences in terms of level of progression and temporal variation in level of stress as it bears on psychopathology. For example, persons

who score high on neuroticism may be at increased risk for depression, but not everyone who scores high on this variable will be depressed. The concept of psychopathy has generally been considered a strong predictor of antisocial behavior in adults (Bailey, Coscia, Sehgal & Shelton, 2014; Hare, 1991; Harpur, Hare, & Hakstian, 1989). A clinical syndrome marked by profound emotional deficits and pervasive antisocial behavior, psychopathy has been conceptualized in a three factor model; interpersonal and affective features comprise two separate factors, and impulsive and irresponsible traits comprise the third factor (Hall, Benning & Patrick, 2004). The factor analytic work for this model was validated by Cooke and Michie (2001) using data from the original Psychopathy Checklist-Revised (PCL-R) standardized on a sample of 1,389 incarcerated offenders. These authors labeled factor 1 as an “Arrogant and Deceitful Interpersonal Style” which consisted of a glib and superficial charm, grandiosity, pathological lying and conning, and manipulative behavior style. The second factor, labeled “Deficient Affective Experience”, included lack of remorse, shallow affect, lack of empathy, and failure to accept responsibility for one’s actions. The third factor, termed “Impulsive and Irresponsible Behavioral Style” included proneness to boredom, impulsivity, irresponsibility, parasitic lifestyle, and lack of realistic goals. Clearly, these factor descriptions employ highly value-laden language and, in relation to our earlier discussion, behaviors such as deceit may be regarded either as a socially learned strategy for achieving desired outcomes or as an example of evaluator bias reflecting in instrument design and interpretation. Likewise deficient affective experience may be an indication of apathy, a learned response to traumatic conditions, rather than indicating a personality trait per se.

Cognitive Vulnerability. Important to this domain is discussion of cognitive processing, cognitive distortions and emotional response or reactivity and resulting behavior. Among these concepts is the idea of cognitive vulnerability, an idea that is firmly rooted within diathesis-stress perspectives that grew from the studies of depression. This idea suggests that negative cognitive factors emerge during stressful situations. This cognitive reactivity uniquely characterizes individuals who are vulnerable to depression and stimulates processes linked to the onset, relapse, and recurrence of depression (Scher, Ingram & Segal, 2005). Negative moods and negative emotions are mutually reinforcing in depression, facilitating negative cognitive processing, which, in turn, results in negative cognitive interpretations (Beck & Perkins, 2001).

Cognitive processing with anxiety disorders functions a bit differently; there is an appraisal and overestimation of threat represented by environmental or internal bodily stimuli that is in contrast to depression, which centers on ideation relevant to hopelessness and past loss (Riskind, Willimans & Joiner, 2006). In these models, cognitive vulnerability to anxiety disorders hinges on the development of danger schemas that distort information processing (e.g. attention, interpretation, and memory for threat stimuli). As a result, the individual overestimates the magnitude and severity of threat, underestimates coping resources, and overuses compensatory self-protective strategies such as cognitive or behavioral avoidance. A meta-analysis conducted by Beck and Perkins (2001) however, indicates that perceptions of threat and worry are common to both depression and anxiety, an area in need for more extensive research.

Out of the discussion of the vulnerability stress model of schizophrenia, and again with the application of the model to depression, emerges the importance of emotional reactivity to daily life stressors. Reactivity to life stressors has been defined as the dynamic interplay between daily stressors and mood and

involves rapid changes over time (Myin-Germeys & van Os, 2007). The literature has tended to associate early environmental factors with later psychopathic behavior. Attachment theory (Bowlby, 1973) provides a theoretical perspective for understanding an individual's experience of negative mood and interpersonal problems. Generally the theory states that an individuals' emotional experiences with primary caregivers lead to the development of attachment security or insecurity and their ability to relate with others and cope with stress. A poor caregiver experience results in an individual who, as Brennan, Clark, and Shaver (1998) have indicated, as an adult is either attachment anxious or attachment avoidant. Adult attachment anxiety is characterized by fear of rejection and abandonment. Adult attachment avoidance is characterized as the fear of intimacy and dependence, and linked to depression, anxiety and negative affect (Wei, Mallinckrodt, Russell, & Abraham, 2004; Lopez, Mauricio, Gormley, Simko, & Berger, 2001) and pathological narcissism (Wei, Vogel, Ku, Zakalik, 2005). In both situations, these individuals experience difficulties with interpersonal problems, increased feelings of loneliness, and greater hostility toward others. It appears that attachment insecurity contributes to development of maladaptive affect regulation strategies, and the rigid use of maladaptive affect regulation may then contribute to negative mood and interpersonal problems.

Physical aggression. Physical aggression, also noted in the proposed vulnerability stress model of mental illness in incarcerated persons, has been found to be associated with substance use, suggesting that it may be an important antecedent in earlier life pathways to substance use (Fite, Colder, Lochman & Wells, 2007). Subtypes of aggression, proactive and reactive are of particular interest to the discussion of developmental origins and consequences of aggression. Proactive aggression is a goal-oriented and calculated behavior that is motivated by external reward (Dodge, Lochman, Harnish, Bates, Pettit, 1997). In

contrast, reactive aggression represents aggressive behavior in response to behavior that is perceived as threatening or intentional. Proactive and reactive aggression has been found to relate differentially to many variables, including peer relations and long term outcomes. Proactively aggressive children are often viewed positively and rated as popular by their peers (Prinstein & Cillessen, 2003) and tend to affiliate with other proactively aggressive children (Poulin & Boivin, 2000). Proactive aggression is also associated with delinquency and violence in adolescence (Brendgen, Vitaro, Tremblay, & Lavoie, 2001) and with high psychopathy scores among adult inmates (Cornell, Warren, Hawk, Stafford, Orem, Pine, 1996). Reactively aggressive children, in contrast, are not liked by their peers and are rejected at all ages (Prinstein & Cillessen, 2003). The long-term behavioral outcomes of reactive aggression are mixed, suggesting that proactive aggression is more strongly associated with negative long-term behavioral outcomes.

Prisonization. As mentioned earlier, in the development of this matrix, prisonization became the center block of our conceptualization, indicating its influence and overlapping symptoms. As we continue to examine the Psychological Domain in the model, consider the Environmental Stress Factors related to the “incarceration event”. The broad psychological effects of incarceration are considered by some as “retraumatizing” given the high number of individuals with traumatic histories (Dirks, 2004). These psychological effects have been termed “prisonization” and refer to the normal adaptation by individuals who are incarcerated (Clemmer, 1940). Behaviors which are seen in the population as a result of this adaptation are: dependence, hyper vigilance, emotional over control.

Impulsivity. Impulsivity behavior poses a safety challenge when inmates are behaviorally difficult to manage. Impulsivity is one element of a diagnosis of borderline personality disorder, and persons with this

disorder exhibit a high risk of self-injury. It is also frequently comorbid with PTSD (Leichsenring, Leibing, Kruse, New & Leweke, 2011).

The utility of the five-factor model (FFM) personality traits is expanded upon by the fact that responses can be re-purposed to assess impulsivity. Whiteside and Lynam's (2001) Urgency- (lack of) Premeditation- (lack of) Perseverance – Sensation Seeking (UPPS) measure of impulsivity is constructed from FFM items and is a valid and reliable measure of impulsivity. The interaction of Lack of Premeditation (failure to consider the consequences of one's actions) and Negative Urgency (tendency to exhibit impulsive behavior when experiencing negative affective states) subscales was found to be predictive of non-suicidal self-injury and suicidality in a sample of residential drug users (Lynam, Miller, Miller, Bornovalova & Lejuez, 2011).

The UPPS scale also accounts for 64% of variance attributable to borderline personality disorder (Whiteside, Lynam, Miller & Reynolds, 2005). One study found that nearly 30% of newly-incarcerated offenders exhibit borderline personality disorder (Black, Gunter, Allen, Blum, Arndt et al. 2007).

Coping. Essential to survival of an incarceration experience is the ability to adapt to one's environment, and hopefully to do this in a healthy way. This is a challenge in an environment such as a prison. Carver et al. (1989) found that factors associated with lower anxiety include active coping, planning, positive re-framing, and acceptance. Factors associated with greater anxiety are venting, denial, mental disengagement and behavioral disengagement. The selection of coping responses is influenced by personality. Persons who score high in neuroticism or who score low on agreeableness tend to engage in

disengagement and venting responses; persons who score high on conscientiousness are more likely to rely on religion and are relatively less likely to rely on substance use (Panayiotou, Kokkinos, & Kapsou, 2014).

In a study of juvenile offenders adjusting to incarceration, social support seeking was found to be associated with a reduction in internalizing and externalizing symptoms. Acceptance was also associated with internalizing symptoms, whereas denial was associated with increasing severity of symptoms. Active coping was associated with a reduction in violent infractions among youth with a history of violence (Shulman & Cauffman, 2012).

In a study of prisoners in medium- and maximum-security administered the *Brief COPE* social support was found to be negatively associated with serious infractions whereas religion and venting emotions were positively associated with infractions (Rocheleau, 2014). Given that religion tends to be associated with greater adjustment (as will be discussed below), Rocheleau's finding regarding religion is unusual; she speculates that persons turn to religion only after other coping responses have been tried without success, suggestive of the possibility that the individual is confronting a particularly taxing stressor. Coping strategies however, can be taught and are frequently incorporated into treatment programming with success.

Clinical Assessments and Research Measurements for the Psychological Domain

Researchers have identified a range of factors that are associated with psychological adjustment and sensitive to treatment-related change. The *Revised Behavior and Symptom Identification Scale* (BASIS-R; Eisen, Normand, Belanger, Spiro & Esch, 2004) is a brief screening instrument which taps self-reported symptoms of depression, interpersonal problems, psychotic symptoms, drug/alcohol use, emotional lability, and self-

harm. This instrument has been used in correctional populations, distinguishing different levels of function among incarcerated PMI with or without comorbid substance use (Pollack, Cramer & Varner, 2000), and detected clinically meaningful change among participants in a jail diversion program (Stainbrook, Penney & Elwyn, 2015).

Aggression and impulsivity and the ability to predict these behaviors post-release are of particular interest in this population (Kesten, Leavitt-Smith, Rau, Shelton, Zhang, Wagner, & Trestman, 2012).

Assessments of these variables are becoming more regular in correctional systems, increasing the demand for use of standardized instruments and comparisons with community and mental health populations. Yet, these are not well documented, or methods are not standardized (Sevecke, Lemkuhl, Krischer, 2009; Burns, Bird, Leach, Higgins, 2003; Wang, Rogers, Giles, Diamond, Herrington-Wang, Taylor, 1997).

An additional assessment of behavior, to determine excessive, inappropriate, or lack of behavior performance could be available from system utilization review indicators such as discipline history during prior incarcerations or prior to incarceration, criminal behavior (severity of offense, pattern and frequency of offending) disciplinary tickets (which are assigned for a wide variety of infractions, and should be examined judiciously), and risk scores (which again are assigned by staff with different assessment capabilities which should be taken into consideration). Assessment of functioning, conducted by front line clinicians and COs can be completed utilizing the Corrections Modified – Global Assessment of Functioning (Shelton & Wakai, 2014), a quick assessment across all domains developed and tested within the prison environment and well correlated with the community version of this instrument.

Aggression might be measured by the *UPPS Impulsivity Scale*, in particular the Lack of Premeditation and Sensation Seeking subscales which are predictive of aggressive behavior (Derefinko, DeWall, Metzke & Walsh, 2011). Likewise, the *Psychopathic Personality Inventory*, discussed earlier, is predictive of aggression (Edens, Poythress & Watkins, 2001). However, for a specific research purpose, an investigator may wish to use a standardized measure of aggression that has been utilized with inmates and comparisons with community and mental health populations, which unfortunately are not well documented. The *Buss-Perry Aggression Scale* (Buss & Perry, 1992), a well standardized measure of aggression, has been used the most frequently with inmate populations (Smith, Waterman & Ward, 2006; Diamond, Wang & Buffington-Vollum, 2005; Wang & Diamond, 1999). The *Overt Aggression Scale-M* (Coccaro, Harvey, Kupsaw-Lawrence & Herbert, 1991) is another standardized aggression scale found in research on aggression in corrections populations (e.g., Sevecke, Lemkuhl & Krischer, 2009; Burns, Bird, Leach, & Higgins, 2003).

Haney (2001) observes that examples of prisonized behavior include interpersonal dependency, hypervigilance, emotional over control (for fear of exposing a weakness), social withdrawal and isolation (as a survival skill), an internalization of exploitive norms and diminished self-worth. There is overlap between these symptoms (e.g., hypervigilance, emotional over control) and those of PTSD, and some individuals may have symptoms warranting a clinical diagnosis of PTSD. The *Davidson Trauma Scale* (DTS, Davidson, Book, Colket, Tupler, Roth et al. 1997), a measure of posttraumatic symptoms, is a suitable instrument for examining most of these aspects of prisonization. Others have identified apathy is an important feature of prisonization (Cnaan et al., 2008). One validated measure of this construct is the *Apathy Evaluation Scale*

(AES, Marin, Biedrzycki, & Firinciogullari, 2001), which assesses loss of interest in activities, low initiative, and poor social skills.

Standardized instruments found in the literature documenting stress, coping and psychopathology are based upon early work of Lazarus and Folkman and include the *Ways of Coping Checklist* (Aldwin, Folkman, Shaefer, Coyne & Lazarus, 1980), the *Coping Strategies Inventory* (Tobin, Holroyd Reynolds & Wigal, 1989); and the *Coping Inventory for Stressful Situations* (Endler & Parker, 1990). The *COPE* scale (Carver et al., 1989) and the *Brief COPE* (Carver, 1997) were designed to resolve ambiguities in *Ways of Coping Checklist* items. Subscales consist of active coping (taking steps to improve the situation), planning (devising steps to take in the future), positive re-framing, seeking emotional support, seeking instrumental support, acceptance, humor, religion, self-distraction, denial, venting, self-blame, substance use, behavioral disengagement.

In our model, under the Psychological Domain column, and in the row for Individual Vulnerability Factors, are the variables for inclusion derived from clinical practice and interdisciplinary intake assessments to be determined by highly skilled forensic clinicians to include: psychiatric diagnosis, assessment of co-occurring disorders and presence of personality disorders. Its psychometric limitations notwithstanding, the Screening Version of the *Psychopathy Checklist-Revised* (PCL-SV, Hart, Cox & Hare, 1995) designed to complement the PCL-R (Hare, 1991) is routinely used in forensic settings to measure traits of psychopathic personality disorder (Morrissey, Mooney, Hogue, Lindsay & Taylor, 2007). Those variables would reference cognitive measures examining distortions and rigidity and personality dimensions. These would be determined through referral for a more detailed mental health assessment based upon initial

intake assessments and mental health risk scores. Of further interest in this model would be an assessment of individual anxiety sensitivity, or emotional reactivity, or lack thereof.

Social Domain

Social interactions may provide a source of stress. Attention has already been given to neuroticism and its relationship to stress generation, manifesting as interpersonal conflict and the perception of being negatively evaluated by others. Persons who score low on every facet of FFM agreeableness – which relates to the level of trust, empathy, and cooperativeness exhibited during interpersonal interactions – will likely exhibit psychopathy (Ross et al., 2008). Negative social interactions – consisting of undermining behaviors, angry criticism, hassling, domineering, and mistrust – may be more deleterious than no social support at all (Heaney & Israel, 2008).

Social Support

Having said that, social support is likely related to improved health, the capacity to cope effectively with stress, and reduce exposure to stress. Heaney and Israel (2008) conclude that social support satisfies basic human needs for companionship, intimacy, and a sense of belonging. It leads to new social contacts and the acquisition of problem-solving skills, reduces environmental uncertainty and unpredictability, fosters perceived personal control, and supports positive reappraisal of stressors.

Social support takes various forms, including: (1) emotional support: provision of empathy, love, trust, and caring, (2) instrumental support: provision of tangible aid and services to a person in need, (3) informational support: provision of advice, suggestions, and knowledge, and (4) appraisal support:

provision of constructive feedback and affirmation. Social networks may be distinguished in terms of size, level of bi-directionality, the strength of individual bonds, and geographic distance of members.

From this work, two models: the deprivation and importation models, were generated as predictors of prisonization. The deprivation model emphasizes the importance of the pressures and problems caused by the experience of incarceration resulting in creation of an inmate subculture. The importation model, on the other hand, emphasizes the effects of pre-prison socialization and experience on the inmate social system. It appears in the prison harm literature, studies using both person and situational variables together have achieved greater explanatory strength (Velarde, 2002; Zingraff, 1980). For the inmate with a mental illness, however, the development and retention of adaptations to incarceration is even more problematic. The mentally ill inmates suffer from stigmatization by other inmates, (Edwards, 2000), incur a greater numbers of disciplinary infractions (Shelton & Wakai, 2014; Toch & Adams, 1986), and may be placed in more restrictive housing units (Lovell, Cloyes, Allen, & Rhodes, 2000). If transferred or released to mental health facilities or community-based programs, their behaviors, such as suspiciousness of others, may hinder their goals in treatment. Interestingly, the literature rarely discussed the personal strengths or potentially prosocial behaviors from pre-prison socialization and experiences noted in the importation model. This deficit in conceptualization is addressed in the developing RSC model.

Social stress is a recurring factor in most people's lives, and by virtue of its widespread occurrence and the known impact that exposure to chronic social stress has upon many systemic and mental disorders, determining the relationships between social factors and individual vulnerability to chronic social stress exposure is important to this discussion of determining individual disease susceptibility. We are reminded

that being exposed to social stress does not automatically predict subsequent pathological consequences; not all individuals exposed to social stress will progress to disease or disorder. Within the framework of allostasis and allostatic load briefly mentioned earlier, with chronic stress, the immune response that was stimulated first by the acute stress event becomes depressed resulting in a progressive change in physiology (allostatic load). Significantly, studies imply that allostatic overload is more likely to develop when stressors are of a social nature and are unpredictable (Bartolomucci, Palanza, Sacerdote, Panerai, Sgoifo, Dantzer, & Parmigiani, 2005).

Social support and social networks. Pertinent to the discussion of the Social Domain of our model is the concept of social support and social support networks. Social support is considered important for all people in the promotion of physical health, mental health, stress-coping capability, and community living satisfaction (Bloom, 1990). The behaviors and relationships involved in social support have been conceptualized in various ways: defined as social networks, supportive behaviors, and support appraisals (Vaux, 1988); to be primarily cognitive or psychological characteristics of the individual (Sarason, Sarason, and Pierce, 1990); consist of four components: subjective beliefs, everyday support, potential support, and actual crisis support (Veiel and Baumann, 1992); and specified as listening, task appreciation, task challenge, emotional support, emotional challenge, reality confirmation, tangible assistance, and personal assistance (Richman, Rosenfeld & Hardy, 1993).

In conceptualizing social support, one must appreciate that social supports are probably structured, perceived, and received differently in different populations. The characteristics of social support for seriously mentally ill people and those who have been incarcerated are different from those for the general

population. Network structure is an essential support component for re-entry, given that PMI and persons who have been incarcerated tend to benefit from structure and predictability in their lives (Friestad & Hansen, 2005; Silver & Teasdale, 2005). Interestingly, Hammer (1981) found that it is more adaptive for PMI to have involvement with a range of social network clusters each consisting of relatively few people, than fewer clusters each consisting of greater numbers of people. Other studies have found the social networks of PMI tend to consist of 10-15 people, or half the number found in the networks of the general population (Atkinson, 1986; Cutler, Tatum, & Shore, 1987). The smaller network sizes are thought to be partially the result of social skills deficits, but also to reflect a protective distancing by people with serious mental illness, who function most comfortably with comparatively low levels of stimulation (Gottesman, 1991).

Religion. Religious practice among incarcerated persons is viewed with some suspicion by correctional staff, owing to instances – which may or may not be representative but are highly salient – in which professed religious faith is used to shield gang activity, secure external resources, obtain political influence, or to create a positive impression in the eyes of parole board members. Also, non-Christian faiths and faiths tied to radical political views may be received with relatively little toleration by prison administrators (Thomas & Zaitzow, 2006).

From a pragmatic standpoint, questions have been raised regarding the efficacy of religious faith in reducing the risk of recidivism. Historically, studies have failed to show an association between religious participation and reduced recidivism; it has also been noted, however, that these studies are methodologically weak. More rigorous studies do suggest that religion is a protective factor with respect to recidivism. However, it is more likely to have an impact on low-level offenders as opposed to persons

convicted of serious crimes, and tends to be more effective among women as opposed to men (Shelton & Bailey, 2016). Apart from recidivism, religious involvement may promote recovery from substance abuse (Dodson et al., 2011). Kerley, Matthews, and Blanchard (2005) found that religious belief and participation in religious services were directly associated with reduced arguing and indirectly associated with reduced fighting among inmates.

McCullough and Willoughby (2009), in a review of literature, cite evidence that religion provides a valuable context for building social support networks. Communities of like-minded individuals help individual members adhere to standards of conduct that promote increased self-regulation of impulsive behavior. Religious practice offer specific guidance on adaptive coping responses such as positive reappraisal. So it may be that the impact of group membership rather than religious belief that has a positive effect upon the inmate's experience of incarceration.

Stigma. Two theories of stigma are of particular interest in our matrix: the first being structural stigma, which describes a process that works to deny people with a mental illness or otherwise disenfranchised their entitlement to things that people who are considered "normal" take for granted (Johnstone, 2001). The second theory is self-stigma, an internal evaluation process whereby people judge themselves (Corrigan, Larson & Rusch, 2009). This judgment could be a result of messages received from societal norms, but ultimately it is the individual who is creating the judgment toward himself or herself. Self-efficacy has an impact on the belief that one can perform; consequently, confidence in one's future is greatly reduced when self-efficacy is poor (Blankertz, 2001; Corrigan, 2004). Individuals may internalize an identity that dehumanizes them, described by Corrigan and Watson (2002) as a private shame that affects

ability to live independently. Corrigan et al refer to this as the “why try” effect. Relevant status variables include substance user, past or present incarceration, poverty, gender, physical or psychiatric disability, and racial/ethnic background. Social stigma involves perceptions of cues exhibited by persons of a particular status, resulting in activation of stereotypes, and prejudice or discrimination against that person (Corrigan, 2004). Derived from social identity theory, stigma is a process in which people use social constructs to judge or label someone who is different or disfavored (Overton & Medina, 2008). Being PMI, a substance user, and a former inmate are all sources of stigma, and many former inmates are subject to this “triple stigma” and consequently are at high risk of homelessness, parole violations, and recidivism (Hartwell, 2004).

Lastly, consider the effects of health disparities upon this population. As discussed by Geronimus, Hicken, Keene, Bound (2006), the “weathering hypothesis” suggests that health may decline in early adulthood as a physical consequence of cascading socioeconomic stressors. Allostatic load, as discussed, captures the wear and tear the body experiences as it strives to achieve stability in disruptive environments. Life expectancy, the statistical projection of the length of an individual’s life span based on probabilities and assumptions of living conditions and other affecting factors (described as the best indicator of population health, PAHO, 2002) needs to be considered to fully understand the how stress-related chronic diseases contribute to excess mortality in marginalized populations, such as those with mental disorders (Dembling, Chen & Vachon, 1999).

Gender. Starting in adolescence, women experience a greater burden of internalizing disorders manifesting as depression and anxiety, whereas men experience a greater burden of externalizing disorders including antisocial personality and substance abuse, and are more likely to be aggressive and have

difficulty forming close relationships and maintaining social support networks. These differences are presumably influenced by sociocultural constructions of masculinity and femininity (Rosenfield & Mouzon, 2012). Among newly incarcerated persons, women are less likely to have a history of alcohol use but are also less likely to seek treatment for it, possibly owing to gender-based stigma and limited availability of community-based female-only groups. In this population, there is a higher prevalence of anxiety, borderline personality features, and trauma-related symptoms among women as compared to men (Drapalski, Youman, Stuewig, & Tangney 2009).

Clinical Assessments and Research Measurements for the Social Domain

Variables targeting ineffective personal coping responses are located in the model under the Psychological Domain column and in the row for Environmental Stress Factors. Standardized instruments found in the literature documenting stress, coping and psychopathology are based upon early work of Lazarus (1966) and include the Ways of Coping Checklist (Aldwin, Folkman, Shaefer, Coyne & Lazarus, 1980), the Coping Strategies Inventory (Tobin, Holroyd, Reynolds & Wigal, 1989); and the Coping Inventory for Stressful Situations (Endler & Parker, 1990). Examples of studies targeting coping of inmate populations are a study of substance abuse, sex offenders and intimacy deficits (Looman, Abrecen, DiFrazio & Maillett, 2004); coping strategies and attachment in pedophiles (Kear-Colwell & Sawle, 2001); and, mature coping skills of adult and juvenile offenders (Shelton, Kesten, Zhang, Trestman, 2011; Soderstrom, Castellano & Figaro, 2001). An additional assessment, related to coping, would be the Structured Assessment of Correctional Adaptation (SACA) developed by Rotter and colleagues (1999, 2005) which assesses the

adaptation of mentally ill inmates to the prison environment, but is a fairly new instrument and in need of further reliability and validity testing.

Individual Vulnerability Factors listed under the Social Domain (Table 1) include social supports, or their lack, and stigma. As with community-living persons with mental illness, incarcerated individuals with mental disorders burn-out support networks over time in part due to their maladaptive coping styles and low perceived sense of control. Religious affiliation, as noted in the model, can be a support when utilized, as would a sense of spirituality. These sources of data would be derived from self-report upon intake during the assessment process. The impact of self-stigma, or the internalized experience of mental illness and incarceration, would be assessed by the clinician by determining the inmate's processing of social information to determine if the individual exhibits a biased attention to and encoding of hostile situation cues. Both the Self-stigma of Mental Illness Scale (Corrigan, Watson & Barr, 2006) and the Perceived Devaluation-Discrimination Scale (Link, Cullen, Frank & Wozniak, 1987) have been used with psychiatric samples, but not applied to corrections (Vogel, Wade & Hackler, 2007; Fung, Tsang, Corrigan, Lam, Cheng, 2007). To complete this section of the model, the "weathering hypothesis", which refers to the cumulative effect of stress of differential racial or health disparities such as the burden of poverty, needs be considered here (Geronimus, 1996; Saari, 1987).

Environmental Stress Factors

Family Stressors.

Regarding family stressors, parallels can be drawn between burdens associated with individuals who suffer mental illnesses and those who are incarcerated, and certainly among those individuals who have the

experience of both events. To maintain a connection with the family member who is incarcerated is often an additional economic burden, particularly if the incarcerated person is serving a longer sentence, if visits are discouraged (for any number of reasons), or if the economic, physical, and emotional hardships associated with traveling to and from the prison are just too great a burden (Cooke, 2002). Unfortunately, when a parent goes to prison, any cohesion in the family system is disrupted. Burden on the social service system through foster placement for children, for example, is costly as is the additional financial stress to relatives and aging grandparents as they often do not receive similar remuneration as caregivers (Geller, Garfinkel, Cooper, & Mincy, 2009).

In a study of caregivers, Provencher, Perreault, St. Onge, and Rousseau (2003) found that caregivers were 3 times more likely to experience severe psychological distress than reported by those in the general population. This result is consistent with the high prevalence rate of psychological distress in caregivers reported in other studies (Braman, 2004; Saunders, 2003). Uncertainties in caregiving competence as well as conflicts related to multiple roles assumed by caregivers add to the burden of psychological distress felt by caregivers (Provencher et al., 2003). Of critical importance to caregivers are balancing family life and respecting individual needs of family members. In today's managed care environment, caregivers perceive themselves as managers who closely monitor behavioral changes in their ill relatives. In this process, caregivers are left with little time for themselves, lack assistance, and face profound stress.

Only the study by Provencher et al. (2003) examining a stress model of caregiving for mental illness could be found, and no models were found in the literature for caregivers, mental illness and incarceration. However, an examination of the Provencher et al. study is useful to this discussion. These authors propose

that primary stressors for caregivers are related to the challenging and problematic behavior of the individual, and secondary stressors are derived from the difficult consequences that emerge from assuming caregiving functions – namely, objective and subjective burdens. In their model, moderators referred to resources that help family members to deal with the caregiving stressors, such as informal and formal social supports. These supports were defined as family and friends, access to health care resources, and the number and types of services.

Stress and interpersonal relationships

As mentioned earlier, incarceration has been shown to impose stress upon family relationships, and particularly upon marital and relationship strain. The longer the prison term, the more difficult it becomes for formerly incarcerated persons to maintain relationships and restore relationships with partners upon release. This is especially true of those who exhibit the effects of prisonization. Emotional over-control, social withdrawal, and apathy work against the restoration of intimate partner bonds as well as parental relationships (NeSmith, 2015). Shame and anger experienced by the non-incarcerated partners further erodes romantic relationships (Dodge & Pogrebin, 2001; Hairston, 2001) and upon release has potentially devastating consequences for inmates, spouses, and their families. Only one study has investigated the impact of a relationship education intervention with prisoners (Accordino & Guerney, 1998). This was surprising given the documented evidence that for both male and female inmates, maintenance of strong family ties was related to coping and fewer disciplinary problems while incarcerated, and lower recidivism rates (Einhorn, Williams, Stanley, Wunderlin, Markman, Eason, 2008; Dowden and Andrews, 1999; Kemp, Glaser, & Page, 1992) - all associated with successful community reintegration.

Sociability studies examine inmates' friends and contacts with "outside" relatives, friends, and acquaintances. Similar to community populations, older inmates had smaller and closer social networks (Bond, Thompson & Malloy, 2005). One study found older inmates to have more regular contact with the outside world through visits, letters, and phone calls when contrasted with their younger counterparts (Gallagher, 1990). In a second study, 90% of the older inmates had contact with relatives either by phone or mail, with 43% receiving family visits (Vega & Silverman, 1988).

Social Stigma

The 21st century in the US has been noted by some as the "era of incarceration" because an estimated 72.2 million or more Americans are under some form of correctional supervision, including probation and parole (Ruiz, 2011; Webb, 2007; Rodriguez & Webb, 2007; Walmsley, 2006). The high incarceration rate raises several serious questions that have been posed to a Special Hearing of the Joint Economic Committee of the U.S. Senate in 2007, underscoring the fact that the rate of growth of spending on corrections in state budgets has exceeded that for education, health care, social services, transportation and environmental protection. Witnesses advocated for diversion of individuals who are not threats to public safety into serious and structured community based alternatives to prison (Jacobson, 2007). Prevention strategies, such as increasing high school graduation rates, neighborhood-based law enforcement initiatives, and increases in employment and wages are promoted to effectively reduce crime over the greater use of prison (Albert, 2007; Loury & Stoltz, 2007; Western, 2007).

The impact upon the individual is portrayed in a statistic showing that more than half of all inmates who are released are re-incarcerated within three years (Jacobson, 2007). The strain of trying to adjust in the

community after incarceration is not an easy task. After release from prison, offenders face many barriers, often called “invisible punishments” (Nolan, 2007) because they are frequently denied parental rights, driver’s licenses, student loans, the right to vote, and they experience the biases that come from having been incarcerated or treated for a mental illness, such as poor public housing, limited employment opportunities (even with skills), and difficulties accessing health care (Shelton, 2015). Transitioning from an institutional environment where all decisions are made for them, to the community environment where these many decisions and choices need be made on a more independent basis, individuals can be overwhelmed by feelings of intense stress and worry.

Ecological or Community-level Vulnerabilities

Gee and Payne-Sturgis (2004) in their discussion of psychosocial environmental concepts, link ethnicity with residential location. These authors note specifically that minorities are often living in communities with differential exposure to health risks. While their discussion is of neighborhood stressors and pollution sources that create adverse health conditions and that are counterbalanced by neighborhood resources, it is reasonable to apply this thinking to correctional settings. Correctional settings, many of which have large minority populations, can be considered “neighborhoods” and as such have their own differential exposures to health risks that create adverse health conditions. Many resources are provided to attend to counterbalancing these stressors. But the opportunity to translate into individual vulnerabilities cannot be ignored, nor the opportunity for structuring health promotion activities (Shelton, 2015). Community stress theory is also derived from research on the stress process among individuals (Lazarus and Folkman 1984; Selye 1976). Community stressors found in correctional settings include noise (Ouis,

2001), litter, density, and residential crowding (Fleming, Baum & Weiss, 1987; Evans and Lepore, 1993), social disorganization, racial discrimination, fear, and economic deprivation (Krieger and Higgins 2002; Macintyre, Ellaway & Cummings 2002). Chronic activation of the stress system, believed to lead to allostatic load (the “wear and tear” on organ systems) yields way to illness (McEwen 1998) and premature aging (Anno et al, 2004).

Living in a group, like other behavioral traits, has costs and benefits. Access to resources and their distribution are common issues among individuals belonging to social groups. Genetic, experiential and environmental factors interact to determine the position of an individual within a dominance hierarchy and influence the way an individual copes with social and environmental challenges. Archer, Ireland and Power (2007) studied bullying behavior of 1,253 adult offenders (728 men and 525 women) in eleven prisons in the UK. These authors were interested in bullying as a form of displaced aggression in prison samples. In measures of aggression, they used items such as ‘Slammed or kicked the door afterwards’ to assess displaced physical aggression, and ‘Sworn at them after they had gone’ for verbal forms to demonstrate ineffective, low-cost, aggression. They found those classed as bullies had higher scores than non-bullies on direct verbal and physical aggression, indirect aggression, verbal and physical displaced aggression, and revenge plans and fantasies; lower values for fear/avoidance; and higher impulsiveness and instrumental and expressive attributions. Those classed as victims showed higher scores than non-victims for fear/avoidance, displaced physical aggression and impulsiveness. Males were clearly more directly physically aggressive and females more fear/avoidant.

The significance of this study lies in understanding the relevance to this model of the effect of overcrowding of the prison environment and its social structure. Archer, Ireland and Power (2007) define displaced aggression as aggression directed towards a target other than the source of the provocation. Miller, Pedersen, Earleywine, and Pollock (2003) highlight that this type of delayed aggressive response can produce a disproportionate aggressive response to a later triggering event secondary to short-term arousal and longer-term rumination over the provoking event. Further, displaced aggression is a low-cost outlet for aggressive impulses in that there is less danger of retaliation, albeit danger from self-injury. Revenge plans and fantasies are also linked to ruminative thoughts about a provoking event. The combination of high provocation and high retaliatory power of the opponent produced a response termed "delayed hostility". This consisted of doing nothing at the time, but feeling frustrated and planning to avenge the provocation later. Sukhodolsky, Golub, and Cromwell (2001) found that men ruminated over anger-inducing events and tended to hold thoughts of revenge longer than women did. This is consistent with findings that men report more homicidal fantasies than women do (Crabb, 2000). The main alternative non-aggressive response to provocation is fear and avoidance. Similar situations can produce either aggression or fear depending on the intensity of the provocation, and internal variables affecting the threshold for fear responses in that individual (Archer, 1976; Berkowitz, 1962). Fear responses to a bullying situation are higher in those who have themselves been victims of bullying than in those who have not, and fewer fear responses in those who are themselves perpetrators than in those who are not perpetrators.

Bullying emerged as a significant behavior of concern to clinicians and correctional officers in the development of a standardized measure of clinical functioning for inmates. Shelton and Wakai (2014) note

that bullying was perceived in some cases to be a protective behavior by correctional officers, but a behavior that could easily “go over the line toward uncontrolled aggression”. Balancing such behavior requires and individual to be on high alert causing chronic anxiety and tension.

Clinical Assessments and Research Measurements for the Environmental Stress Factors

In our matrix (Table 1), under the Social Domain column and crossed with both Individual Vulnerabilities and Environmental Stress Factors rows are the family and neighborhood characteristics (marital status, number of children, relatives living in the home, number of friends and social support network, distance to social units and level of support from social units, employment status, disability, food insecurity) that could be obtained from self-report upon intake assessment or records if available. Disability and vocational need, or assessment of risk, would be determined from a more detailed interdisciplinary assessment. Included under this section of the model would be the length of separation due to prolonged incarceration and the number of incarcerations. Social stigma is viewed from how society views the individual, as a convict, as a mentally ill individual, as a drug addict, certainly influences the outcomes upon re-entry with regard to employment, housing and successful reintegration into the community. Ecological or environmental factors that would impact stress and coping while incarcerated or when back in the community include noise, overcrowding, pollutants, and organizational stressors. Gee & Payne-Sturges (2004) provide a discussion of race, community environmental conditions and health that is pertinent to this discussion because it is well documented that, upon re-entry, one of the challenges to successful reintegration of inmates is that they return to the same environments that encouraged risky behaviors

contributing to their incarceration (Petersilia, 2000). Lindquist and Lindquist (1997) and Tataro (2006) discuss the impact of environmental stressors among jail inmates. Many of these variables could be collected from system utilization reviews or from community public health indices.

Discussion

In this paper, the biopsychosocial vulnerability stress model (VSM) was applied to the corrections population. Much attention in this paper has been applied to those persons with mental illness and co-occurring substance abuse disorders. The matrix developed (Table 1) provides a framework that can be utilized by an interdisciplinary team of clinicians, COs and researchers collaborating to improve clinical services, safety and patient care outcomes. The VSM matrix as outlined in Table 1 was particularly useful for an examination of the available evidence from clinical practice and in the literature, as well as to identify the gaps in its translation to incarcerated populations. As mentioned previously, the similarities between the corrections populations, community-based and hospitalized psychiatric populations permits us to translate evidence across treatment environments. The matrix begins to organize our conceptualization of the complexities of the “experience” of the incarcerated mentally ill population.

Among the next steps, as guided by Walker and Avant (2005) we will begin to apply data to the model to see how it works initially with offender populations, inclusive of those with mental illness and substance abuse diagnoses. Through this process we will refined the RSC model. Our approach begins with descriptions and collective case studies of inmate groups by age, race and gender; and presents use of data that are available through record review or utilization review. It would be expected that the younger inmates, particularly males, would have higher levels of aggression and greater difficulty with adjusting to

the prison environment, and similarly, have a harder time with re-entry success. Transition points are expected to be difficult for individuals with an incarceration experience, no matter what their age, gender, race or culture. Would their utilization of health services be different than that for other sub-populations or for those located in different sectors of the criminal justice system? We expect a high number of individuals with co-occurring disorders, but what is the significance of added medical conditions upon behavior and coping? Which individuals are more receptive to clinical interventions and benefit from them? Are there mediators or moderators in the model that we can identify that not only reduce stressors but work to enhance treatment effect? From the model, can we improve matching treatments (such as stress reduction and coping strategies) to the individual. We advocate for self-care strategies, but recognize that there are many details that are yet to be explored.

The attention paid to standardized measures that could be incorporated into the health care structure of a corrections system that would be useful to both clinicians and researchers is of importance. Challenges exist given the status of reliability and validity of measures that are useful to both clinicians and researchers in this environment. A gap in the literature exists in the publication of standardized instrument scores on corrections populations, or comparisons with mental health and community samples. Further, many corrections systems have endeavored to tailor and standardize instruments for their specific needs, but this makes it difficult to draw comparisons with community samples, particularly when the standard of care in corrections is to be equivalent to that provided in a community setting (Poster, 1992). Correctional systems have developed assessments in silos, addressing safety and security needs without incorporating health and mental health needs. As electronic medical records are adopted for these settings, incorporating

standardized measures into the electronic medical record should be kept in mind- promoting opportunities for clinically relevant research which responds to needs of patients, clinicians and systems.

The use of the VSM matrix to support clinical intervention studies on individual adaptation (behavioral or medical) while incarcerated and to support re-entry into the community can guide clinical practice. The role of nursing, for example, can be greatly enhanced in corrections to promote this agenda, but the evidence of nursing interventions must be demonstrated in these environments. Nursing roles have the opportunity for many “teachable” moments that can support, enhance and promote inmate health, self-care and adherence to medical and mental health regimens as well as behavioral plans. The relationship between nursing interventions and patient outcomes is well documented (Schubert, Glass, Clarke, Aiken, Schaffert-Witviliet, Sloan & De-Geest, 2008). The expectation for nurses to participate in correctional settings in this manner has not always been recognized or desired (Shelton, 2009). As in many other healthcare settings, nurses in correctional settings need to be retooled for the future. There is a large gap in knowledge about evidence-based practices in correctional nursing and evidence-based treatment in correctional settings. Theoretically supported and successful strategies for addressing correctional nurse competencies for improved clinical outcomes are now emerging in the literature (Shelton, Reagan, Weiskopf, Panosky, Nicholson, & Diaz, 2015), but more work is needed in this area.

Conclusion

The clinical usefulness of the adapted biopsychosocial vulnerability stress model is striking in that it is set up as a matrix in which variables can be selected from multiple levels for consideration in development of clinical programming, evaluation of clinical services, or development of a research study

and is amenable to multi-level statistical modeling. It easily provides for a flexibility to be expanded upon as it is discussed and applied. A framework such as this might guide the development of a quality improvement and informatics system in corrections, or be used to provide a basis of understanding about the shared population between a Department of Corrections and the health care providers.

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