"Humanizing Prison Through Social Neuroscience: From the Abolition of Solitary Confinement to the Pursuit of Social Rehabilitation". In The Routledge Handbook of the Philosophy and…

Preprint · October 2020

CITATIONS
0

READS
521

1 author:

Federica Coppola
Columbia University
8 PUBLICATIONS **9** CITATIONS

SEE PROFILE

To appear in: Focquaert F., Shaw E., Waller B. (eds.), *The Routledge Handbook of the Philosophy and Science of Punishment*, Routledge (Forthcoming)

Humanizing Prison through Social Neuroscience:
From the Abolition of Solitary Confinement to the Pursuit of Social Rehabilitation

Federica Coppola, JD, PhD
Columbia University in the City of New York

Introduction

Since its inception in the 18th century, prison has been the emblem of criminal punishment (Foucault 1977). Prison was originally conceived of as a "more humane alternative to frequent executions" (Bessler 2016:156) as well as an effective way to reform "the soul of delinquents" through isolation, punitiveness, and control (Foucault 1977). Prison is still viewed as the *par excellence* means of meeting the retribution, deterrence, incapacitation, and rehabilitation needs of criminal justice. Despite differences in correctional facilities and regimes, the basic narrative underlying prison—especially in punitive systems such as that of the United States—is that the pain of detention in exclusionary conditions is a consequence that wrongdoers deserve that will allow them to understand the wrongfulness of their misbehavior (Lippke 2003). As a result, they will refrain from reoffending in the future (Johnson 2013).

Specific methods of detention maximize this narrative of incarceration. In the United States, the most representative method is solitary confinement. Notwithstanding the harsh criticism at both national and international levels regarding the excessive (ab)use of solitary confinement on the part of prison administrations, this practice has found

robust support within legislative, administrative, and judiciary bodies on the basis of the alleged efficacy of extreme isolation to meet the discipline, security, and safety needs of prisons (Coppola 2019). In view of these supposed penological functions, solitary confinement remains heavily practiced across states. Even when applied for prolonged periods of time, solitary confinement has hardly been found to constitute cruel and unusual punishment under the Eighth Amendment of the U.S. Constitution (Coppola 2019).

Prisons privilege punitiveness, physical separation, and social and moral exclusion—often in precarious settings—to presumably rationalize the infliction of punishment on a perpetrator. Thereby, they abandon and discount the human dimension of incarcerated people. Abundant psychological evidence demonstrates the negative and long-lasting effects of incarceration (*e.g.* Haney 2012). Notably, behavioral studies have reported that the act of imprisonment as well as the restrictive and exclusionary conditions of prison life can produce or aggravate a number of affective, cognitive, and behavioral deficits, including cognitive decline and affective disturbances such as decreased affect, lack of self-esteem, increased feelings of rejection and humiliation, chronic anger and rage, and problems with self-regulation (*e.g.* Gilligan 2000; Umback et al. 2018; Meijers et al. 2018). A crucial finding is that incarceration can stimulate the same negative emotional feelings and behavioral tendencies that have consistently qualified as risk factors for antisocial conduct and violence in particular (Gilligan 2000).

Psychological perspectives of the deleterious mental effects of incarceration have been supported by the body of social neuroscience research on brain plasticity, social

interaction, and environmental stimulation for physiological brain function, mental health, and social behavior. Such foundation has emerged from the specific line of research on the adverse neurobiological effects of negative social environments, social exclusion, and socio-environmental deprivation. Overall, as a complement to behavioral studies, research on the relationship between the brain and the social environment has offered critical insights that further highlight the vital role of enriched environments and positive social relationships for healthy brain development and function. On the other hand, these studies indicate that socially and environmentally poor settings (such as those analogous to prisons) contribute to or intensify problematic neurobiological patterns that negatively correlate with mental well-being and, ultimately, socially functional behavior.

The intention of this chapter is to employ this body of neuroscientific knowledge to propose a drastic rethinking of the prison system. It aims to utilize this neuroscientific perspective to illustrate why common features of the prison system (i.e. punitiveness, social exclusion, isolation and poor environments) may be extremely damaging for the brain and behavior and can consequently pose a serious risk to an individual's progress toward positive change and reintegration into the community as a socially functional individual.

Based on a review of the studies in Sections I and II, Section III offers several suggestions for embracing this body of knowledge to reform the prison model at both practical and theoretical levels. Section III.A argues for transforming the ethos of prisons to embrace the values of belongingness, dialogue, cooperation, and accountability as well as for re-designing the physical layout of correctional facilities

to make these settings as dignified and home-like as possible. Section III.B illustrates the potential of this body of social neuroscience to challenge the constitutionality of solitary confinement and, as a consequence, to support its abolition or at least a radical reform of its regimes. Finally, Section III.C emphasizes the compatibility of the demonstrated insights from social neuroscience with the tenets of social rehabilitation. Hence, the section argues for the pursuit of social rehabilitation as the most rational and effective goal of the prison system and, ultimately, of criminal justice. The chapter concludes with several remarks about the critical but indirect contribution of social neuroscience to making the criminal justice system more humane.

I. The ineradicable bond between the brain and the social environment

In a famous article, Baumeister and Leary (1995) posited that human beings possess a universal need to belong. The authors characterized this need as a drive to form and maintain strong, stable interpersonal relationships. Moreover, they crucially argued that such need is satisfied by frequent human contact and genuine bonds of caring between individuals. Baumeister and Leary's arguments are in line with a robust body of studies from evolutionary and social psychology that have largely demonstrated that humankind exhibits an ineradicable biological need for social bonds and relationships.

The essence of human beings as social animals lies in the nature of the human brain as a social organ (Siegel 2012). The brain enables us to socially interact, perform social thinking, and navigate and communicate with our social environment (Goleman 2006:4). On the other hand, the social environment continuously shapes our brain morphology and activity, modulates our neurological and physiological reactions, and

permits the brain to perform its natural functions (Hari et al. 2015; Davidson & McEwen 2012).

The "social brain hypothesis" has been highly accredited within the literature to explain the strict mutual relationship between the brain and the social environment (Dunbar 1998; Lieberman 2013). According to this account, humans possess larger brains (and especially larger prefrontal cortices) compared to other species precisely because humans are biologically designed to navigate the most complex social environments. In other words, the size of the human brain is directly proportional with the complexity of its expected social environments. The human brain needs to constantly receive stimulation from its social environment in order to work properly and perform its natural functions.

Research on the relationship between the brain and the social environment has intersected with findings about brain plasticity. A key insight from neuroscience concerns the dynamic nature of the brain. While it was once assumed that the adult brain structure was static and mostly unaltered by the environment or behavior, it has been firmly established that the brain is constantly in flux (Power & Bradley 2017). Thereby, it creates and alters neural pathways throughout a person's life to adapt to new experiences, learn information, and create memories, and its structure and function are ceaselessly molded by socio-environmental influences (Hari et al. 2015).

Research has indicated a positive influence of specific socio-environmental factors—so-called dynamic factors of protection—on brain development and function, mental health, and social behavior (*e.g.* House et al. 1988; Seeman & McEwen 1996; Whittle et al. 2014). Notably, certain social, economic, and environmental factors, including

secure attachments, good child rearing, positive social engagement, exposure to positive environments, and social acceptance, appear to be essential to the development and functioning of key brain areas that support cognitive and affective skills that are linked to (pro)social behavior, such as emotion processing, emotion regulation, or empathic responding (*e.g.* Cozolino 2014; Lieberman 2013).

Consistent with these insights, key research on brain plasticity has revealed that positive social engagement induces positive changes in the neural circuits that underlie cognitive functions, socio-affective skills (e.g. empathy), and social behavior over the entire lifespan (*e.g.* Kelly et al. 2017; Hari et al. 2015; Valk et al. 2017). These changes have been associated with higher cognitive performance, emotional responsiveness, psychological well-being, and prosocial behavior (Davidson & McEwen 2012).

The relevance of the social environment for brain function and behavior has been famously reported in studies with rodents. Several experiments have indicated that rodents that were reared in "enriched environments" (Slater & Cao 2015)—ample cages with toys and changing stimuli—and surrounded by their peers exhibited functional developmental pathways as well as normal sociable tendencies (*e.g.* Rosenzweig & Bennett, 1972; Neil et al. 2018). In contrast, rodents that were reared in deprived environments and under conditions of social isolation exhibited cognitive deficits, aggressive tendencies, hostility, and an incapacity to live in a social environment (*e.g.* Wongwitdecha & Marsden 1996; Tanaka et al. 2010). As discussed shortly, such behavioral dysfunctions correlate with a variety of morphological and functional alterations in the brain. These alterations are an immediate outcome of the persistent conditions of socio-environmental deprivation.

The few studies that have been conducted with humans have replicated these results. For instance, research with children raised in orphanages (Sheridan et al. 2012; Gee at al. 2013) has indicated that such children, who had suffered from early maternal deprivation and diminished attachments, exhibited smaller cortical gray matter volume, atypical amygdala-prefrontal cortex connectivity, and increased cortisol levels compared to children who were raised in home-like settings or family environments. In commenting on these studies, Baskin-Sommers and Fonteneau (2016: 428) have highlighted a parallel between this kind of institutionalized setting and correctional facilities, and observed that settings that are characterized by diminished social contact and deprivation contribute to problematic neurobiological patterns.

Collectively, social neuroscience research offers a critical contribution to clarify the mutual influence of the brain and the social environment on mental health, psychological well-being, and socio-behavioral functioning. The key insight that emerges from this body of research regards the development and maintenance of positive and secure social relationships and the surrounding of stimulating environments for physiological brain function. As discussed in the next section, the absence or breakdown of these protective socio-environmental factors—which often occurs within correctional facilities—risks producing a series of deleterious effects at the neurobiological level. In turn, these effects may translate into potentially permanent mental issues and behavioral dysfunctions. Thus, when a (positive) social environment is lacking, the brain—and the person, as a consequence—is likely to undergo profoundly traumatic consequences in the (very) long term.

II. The neurobiological effects of negative social environments, social exclusion, and socio-environmental deprivation

The relevance of social interactions and environmental stimulation for the brain and behavior finds further support within the body of neuroscientific studies that have explored the adverse neurobiological effects of negative social environments and socio-environmental deprivation.

While more data are needed, an increasing amount of studies have emphasized the deleterious influence of specific socio-environmental factors (so-called "positive factors of risk"), which include a lack of secure attachments, social exclusion, history of abuse, or chronic exposure to violence, on one's neurobiology (*e.g.* McCrory et al. 2010; Hart & Rubia 2012). Specifically, these factors have been found to entail structural and functional alterations across various brain areas that support both cognitive and affective functions, such as empathy or emotion regulation, with adverse implications for (pro)social behavior (Tost et al. 2015).

For instance, several neuroscientific studies have investigated the relationship between cortisol levels (i.e. biological stress response), psychosocial stressors, and violence in adolescence and young adulthood in particular (Ayer et al. 2014). In principle, these studies have suggested that the presence of chronic stressors and inadequate emotional and social support to mitigate the effects of such stressors produce adverse and dysregulating outcomes for an individual's biological stress response as well as long-term negative effects on the brain, mental health, and social behavior (Ayer et al. 2014). For instance, exposure to violence and contextual stressors

has been associated with elevated cortisol levels and hyperresponsivity to threats in the long term. This chronic or long-lasting hyperresponsivity to threats could explain why people (especially youth) who live in violent communities may experience "pathological adaptations" that include a desensitization to violence (Gabarino et al. 2002). Likewise, abuse, trauma, and maltreatment are associated with elevated cortisol levels in both adolescents and adults as well (McCrory et al. 2010). Notably, chronic stress has been evidenced to alter physiological brain function in the long term and especially in brain regions such as the hippocampus, amygdala, and various parts of the prefrontal cortex (PFC) (Brenmer 2006). Dysfunctions in these brain regions have been demonstrated to negatively affect moral reasoning and social functioning and increase the risk of engaging in criminal behaviors that involve aggression and violence (Nee & Vernham 2017: 40).

Other studies have explored the effects of social exclusion on the brain. Of particular relevance is the body of research that has investigated the neurological nature of social pain, which refers to the painful feelings that follow social rejection, social exclusion, or social isolation (Eisenberger 2012a). From a psychological standpoint, social pain has been associated with a variety of psychological symptoms and negative action tendencies that includes anxiety, humiliation, lack of self-esteem, greater rejection sensitivity, and aggression (Eisenberger 2012a). Moreover, several studies have linked the experience of social pain with a stronger predisposition to develop pain disorders (Landa et al. 2012), physical diseases, mental issues, and even a higher risk of mortality (Eisenberger 2012b). Thus, regardless of whether the traumatic effects of social pain are immediately visible, they may manifest and grow over time.

Over the past decade, neuroscientific studies have started to examine the neurological representation of social pain. According to the most influential account in the literature, which is the "shared representation hypothesis," social pain is neurologically akin to physical pain, which is the pain that follows a physical injury. This account holds that, neurologically speaking, social pain shares the same affective component as physical pain. Specifically, it appears to recruit the same neural circuitry, including the dorsal anterior cingulate cortex and the anterior insula (Eisenberger 2012b; Lieberman & Eisenberger 2008).

However, a more recent study (Woo et al. 2014) has suggested that physical pain and social pain involve distinct neural representations within and across brain regions. Thus, the neurological overlap between these two types of pain seems to occur only at a gross anatomical level. Overall, according to this study, social pain and physical pain possibly consist of diverse affective experiences, which entail unique psychological consequences and require different interventions.

Notwithstanding this contrast in the literature, a key insight that has emerged from this body of research is that social pain has a physical reality in the brain, and its experience is not less serious or deleterious than that of physical pain. On the contrary, the consequences of social pain could be more distressful, harmful, and long-lasting for an individual compared to those that follow forms of physical pain.

The study of social pain following social disconnection has integrated with and formed a significant part of the body of social neuroscience research on the neurobiological, psychological, and behavioral effects of socio-environmental deprivation (i.e. extreme isolation) on the brain. Studies on socio-environmental

deprivation with animal models have collectively evidenced a variety of brain damages following extreme isolation. Notably, these studies have revealed that extreme isolation may induce a number of structural and functional alterations in both cortical and subcortical regions, including reduced cortical volume, diminished neuronal connections in cortical areas and the hippocampus (Djordevic et al. 2012), decreased myelin production (Liu et al. 2012), and altered activity in the reward system (Cacioppo et al. 2009) and amygdala (Fowler et al. 2008).

For instance, robust research on the neurobiological impact of chronic stress induced by extreme isolation has found that chronic stress had deleterious effects on brain regions, notably the hippocampus, that support spatial information processing, memory, social information, and emotion regulation (Fone & Porkess 2008; Djordevic et al. 2012; Cacioppo et al. 2009; Ieraci et al. 2016). These alterations have been reported for certain mental illnesses in humans, including post-traumatic stress disorder, depression, and neurocognitive diseases such as Alzheimer's (Logue et al. 2018; Wang et al. 2014; Ouanes & Popp 2019). Moreover, such alterations have been reported in a series of psychological symptoms and negative action tendencies, such as aggression (Fone & Porkess 2008), which are risk factors for socially functional behaviors.

Studies on the effects of extreme isolation on the brain and behavior have crucially highlighted that structural and functional alterations in the brain may manifest even within a short period of time (Makinodan et al. 2012). Furthermore, these alterations may persist even after the reintroduction of the subject into the social environment

(Makinodan et al. 2012). Thus, the studies reflect that socio-environmental deprivation may lead to potentially permanent deleterious effects for the individual.

Although more research on human samples is needed, reliable evidence exists that increased social isolation and diminished physical contact in environments that are analogous to prisons contribute to and reinforce problematic neurobiological patterns. Hence, the socially scarce conditions of a prison setting are likely to "generate or exacerbate neurobiological deficits and maladaptive behaviors...[t]his becomes a significant issue, especially for individuals who are chronic offenders, where existing neurobiological vulnerabilities are intensified in settings of confinement and segregation, thereby reinforcing maladaptive patterns of behavior" (Baskin-Sommers & Fonteneau 2016:428).

IV. Humanizing Prison

While converging with psychological perspectives, findings from social neuroscience provide additional critical information to challenge the efficiency of the current apparatus of the prison system. Notably, these insights support severe criticism of the punitiveness, social disconnection, and (often) precarious environmental conditions that characterize the lives of incarcerated people. Hence, social neuroscience offers another perspective that may encourage a radical reconsideration of the philosophy and reality of prison that can achieve a greater humanization of not only prison facilities but also their internal policies and underlying goals.

The remainder of this chapter precisely illustrates three main implications of the literature review for the prison context. The first implication concerns the

transformation of the prison environment. The second, more specific implication has increasingly attracted attention in the United States and regards the unconstitutionality and, ideally, the abolition or reduction of solitary confinement. The third, theoretical implication refers to the pursuit of social rehabilitation as the ultimate goal of incarceration.

A. Prison Environment

The most essential information to emerge from social neuroscience research concerns the mutually ineradicable tie between the brain and the social environment. As reported above, studies with both animal and human models have indicated the fundamental significance of positive social interactions and stimulating environments for physiological brain function, psychological well-being, and prosocial behavioral tendencies. In combination, these insights highlight the importance of constant positive interactions in stimulating environments for the cultivation of prosocial attitudes precisely because these factors act as positive incentives for brain function and health. Thereby, they stimulate cognitive and socio-emotional competencies that are vital to social and moral life.

This body of empirical knowledge strongly encourages a profound rethinking of the social and physical environment of prisons. In regard to the former, these insights appear to strengthen the position of several authors (Reisel 2015; Gilligan 2000) who have argued for the involvement of positive social engagements and activities as a central feature of prison programs. According to these authors, inclusionary and relationally based approaches are more likely to aid people in eliminating profound

feelings of rejection, exclusion, and humiliation as well as to stimulate them to act in prosocial ways through training, dialogue, and inclusion. Thus, it may be essential for facilities to allow space for human connections in terms of frequent contact with the outside world, education programs, social and recreation activities, and paid labor. These elements can enhance the skills and accomplishments of incarcerated people, which can serve as internalized and reality-based sources of self-respect and self-esteem as well as attract respect and esteem from others and motivate their process of reconstructing their self-identity and a life without crime.

On the other hand, an increasing number of authors (Dhami et al. 2009; Toews 2006; Braswell et al. 2001) have supported the implementation of restorative justice (RJ)-based programs, which aim to allow people in prison to critically take accountability and acknowledge the consequences of their negative behavior through dialogue and confrontations with victims (either actual or surrogate victims, depending on the circumstances) as well as with community members. Notably, empirical evaluations of existing RJ programs in prisons worldwide have reported encouraging results in terms of not only individuals' positive change and healing (*e.g.* Frasey & Williams 2009) but also crime desistance and lower recidivism rates (Lauwaert & Aertsen 2015).

The second implication of this body of neuroscientific knowledge for the prison environment is the transformation of the physical layout of correctional facilities. The empirical research above has illustrated the fundamental importance of stimulating and enriched environments for physiological brain activity, mental health, and positive sociable tendencies. On the other hand, it has suggested that environmental deprivation, which is understood as living in scarce or poor environments without

significant external stimuli, may have negative repercussions for several brain areas that are linked with a variety of cognitive, affective, and social functions.

Taken together, these insights strongly support the replacement of current detention facilities with locations that are as dignified, humane, and approximated to general living conditions as possible. These settings should allow the people within them to have as much internal freedom as possible considering their temporary deprivation of liberty and separation from the community. In this regard, several scholars and national associations have recommended the transformation of jails and prisons from exclusionary and often precarious facilities into secure yet humane settings, such as residential centers or therapeutic communities (*e.g.* Gilligan 2000). For instance, the VERA Institute of Justice, a U.S. non-profit organization for criminal justice, has partnered with a team of architects from MASS Design Group to launch an experimental project that targets the development of future correctional facilities (VERA Institute of Justice 2019). By recalling the "Norwegian prison model," the project reimagines the physical layout of prison facilities to achieve a design that conveys respect for human dignity and promotes inclusivity, dialogue, and effective rehabilitation. This project would transform "prisons" into open yet secure spaces wherein the people who reside there can heal and feel empowered to change their own lives. This design for prisons would facilitate personal growth and change, and, ultimately, restore communities.

Such an ideal prison model admittedly promotes the implementation of the previously reported dynamic socio-environmental factors of protection for mental health, psychological well-being and prosocial attitudes. Thus, while encouraging

individual change, a humanized detention environment that favors inclusion, social relationships, dialogue, and dignity could also be instrumental in resolving the excessive violence in institutionalized settings and eventually decreasing recidivism rates. Altogether, the transformation of correctional facilities into the described centers could be a vital change to not only improve the lives of the people they house but also more fully satisfy the public demands of safety and security to ameliorate the workings and outcomes of criminal justice as a whole.

B. Solitary Confinement

The implications of the above insights from social neuroscience are even more glaring when applied to solitary confinement. In the United States, solitary confinement is a correctional measure that prison officials use to meet disciplinary, protection, or security needs of prisons (Labrecque 2016:51-53). People who are forced into solitary confinement live in conditions of extreme isolation, which entail tiny cells, an absence of meaningful social contacts, subjection to absolute control by prison guards, and potentially indefinite periods of time. Although the harshness of solitary confinement regimes in the United States has received heavy criticism at both the national and international levels, this correctional measure is still legitimate and has not been found to constitute cruel and unusual punishment under the Eighth Amendment of the U.S. Constitution. In brief, solitary confinement per se is completely constitutional.

The standard set of the Supreme Court for assessing whether solitary confinement "becomes" cruel and unusual punishment requires that one or more *accompanying*

material conditions of solitary confinement result in "a wanton and unnecessary infliction of pain" (*Gregg v. Georgia* 1976) upon the individual who was forced into extreme isolation. This requirement is met when such conditions involve a "deprivation of basic identifiable human needs" (*Rhodes v. Chapman* 1981) to an extent that they "inflict harm or create a risk of objectively serious harm," (*Farmer v. Brennan* 1994), and they are enacted with "deliberate indifference" (*Wilson v. Seiter* 1991) by prison personnel. With limited exceptions (*e.g. Wilkerson v. Stalder* 2007*),* the Supreme Court and lower federal courts have perpetuated a narrow application of these standards. Specifically, Courts have tended to interpret the objective prong of the standard by narrowing it down to identifiable physical human needs, including nutrition or shelter (*e.g. Wilson v. Seiter* 1991: 304-05), the lack of which may lead to the infliction of physical harm, such as physical disease or death (see *e.g.* Matter, 2010: 296). Thus, Courts have often discounted the generalized mental pain that is caused by extreme isolation as a sufficient ground to qualify solitary confinement as a form of torture (*see* Lobel 2008).

In a famous federal class action lawsuit before the District Court for the Northern District of California (*Ashker v. Governor of California* 2014), social neuroscience-based evidence was successfully introduced to challenge such dominant interpretation of the conditions of confinement standards and, consequently, to support Eighth Amendment challenges to prolonged solitary confinement (Lobel & Akil 2018). The case concerned the horrors that were suffered by more than 1,000 prisoners who were forced into extreme isolation for prolonged periods of time at California's Pelican Bay

State Prison. The plaintiffs introduced expert neuroscience testimony to support their Eighth Amendment claims.

The core arguments of the expert testimony were that social interaction is fundamental to physiological brain function and health, and the psychological deteriorations (mental harm) that follow social and environmental deprivation are linked to alterations that occur in the brain (Lobel & Akil 2018). Such brain alterations can lead to a wide range of adverse psychological effects, many of which may be long-lasting or even permanent. Based on this evidence, the plaintiffs successfully[1] argued that the harsh conditions of solitary confinement into which the Pelican Bay prisoners were forced could cause or create a substantial risk of causing serious *physical* damage "to a degree prohibited by the Constitution" (Lobel & Akil 2018:67).

The Ashker case has prompted subsequent (ongoing) legal research into the potential of social neuroscience to support challenges to prolonged solitary confinement. Within such research, some authors (*e.g.* Bennion 2015; Coppola 2019) have more radically maintained that this body of scientific knowledge may be used to validate the claim that *solitary confinement should be viewed as per se unconstitutional*.

Overall, arguments for the per se unconstitutionality of solitary confinement in view of neuroscience-based evidence include three main claims. The first is that social interaction and environmental stimulation *are* basic human physical needs that are essential to physiological brain function and mental health. Thus, regardless of its duration or accompanying material conditions, extreme isolation is sufficient per se to deprive a person of his or her fundamental biological needs. Thus, the aspects of

[1] The lawsuit was settled on September 1, 2015. Soon after, the people who had been in solitary confinement for as long as three decades were released into general prison population or into transitional "step-down" programs.

duration and material conditions should be viewed as *pejorative* circumstances that may aggravate the underlying condition of extreme isolation that already qualifies as a severe deprivation of a minimal life necessity (Coppola 2019).

The second and consequential claim concerns the "objectively serious risk of [physical] harm" (i.e. brain damages) due to extreme isolation alone. As Bennion has noted (2015:776), even if a physical (brain) damage following a period in solitary confinement never materializes, "[this] is not dispositive for . . . the test." Indeed, all that matters for the purposes of the test is that the risk of undergoing serious brain deterioration following solitary confinement is objective – that is, it is universal. Neuroscientific findings suggest that *any* person who lives in extreme isolation—even for a short period—is vulnerable to such risk. Moreover, the harm that solitary confinement risks imposing on the brain underpins a number of long-lasting and potentially permanent mental, physical, and physiological conditions. Therefore, the possible harms of solitary confinement are not only disfiguring but may also be permanent (Coppola, 2019).

The third and final argument concerns the "deliberate indifference" requirement. With acknowledging that the core condition of solitary confinement, namely extreme isolation, amounts per se to a wanton and unnecessary infliction of pain and hence constitutes cruel and unusual punishment, "the subjective prong of the test loses its *raison d'être* and becomes superfluous" (Coppola 2019). Given the growing general awareness of the risks that have been linked to life in extreme isolation, proof that a prison official acted with "deliberate indifference" should be inferred from the very act of isolating someone. Imposing extreme isolation on a prisoner entails an

objectively serious and well-known risk of harm; any further subjective inquiry is simply unnecessary.

A serious acknowledgment that extreme isolation alone is constitutionally problematic under current standards may support the abolition—or at least a drastic reform—of solitary confinement regimes. Specifically, it may facilitate the replacement of isolation with alternative measures to meet the security and safety needs of prisons, thereby relegating the separation of a person from the rest of the prison population to a last-resort intervention that is applicable only once all other measures have been exhausted without success. However, even if the latter extreme case should occur, strict time limits as well as sociability and environmental standards should apply.

In regard to time limits, more empirical research is needed to assess the exact maximum time limit for depriving an individual of constant social contact without causing damages. Nevertheless, given the current paucity of jurisprudence on duration limits for solitary confinement, all jurisdictions should ideally abide to international guidelines that mandate a maximum of 15 days of separation of a person from the rest of the prison population (*see* also Haney 2018: 302). With respect to sociability conditions, temporarily separated people should still be able to access as much social engagement as possible, including through education and job programs, rehabilitation and recreation activities, and time with visitors (*see* also Kupers 2017:171-209). Finally, the design of "separation" settings should follow strict environmental standards. In line with the aforementioned suggestions for rethinking general prison settings, separation settings should also be re-designed as spaces that are as secure yet

home-like as possible to allow the people who live in them to experience their incarceration in the most dignified and humanized conditions.

C. Social Rehabilitation

From a more theoretical perspective, the above research from social neuroscience offers support to social rehabilitation (also known as "re-socialization"). As a typical penological goal of most continental European systems, social rehabilitation is a rehabilitative approach to crime that aims to reintegrate convicted persons into society upon their release to allow them to lead law-abiding and self-supporting lives (Ashworth et al. 2009). Thus, social rehabilitation seeks to re-establish positive relationships between perpetrators and the rest of society by facilitating (self-)reform and change on the basis of relational processes.

Social rehabilitation, which is akin to restorative justice in many respects, is grounded in a view of the individual that is *morally dynamic* and *holistic*. Like restorative justice, social rehabilitation endorses the view that people who are involved in the criminal justice system are not "irredeemable" individuals (Maruna 2016). Furthermore, their moral character should not be determined by their wrongdoings. Rather, social rehabilitation maintains a strict separation between a person and his or her actions, and it values the multiple aspects of a person's social identity, especially his or her capacity for positive change. Thus, social rehabilitation recognizes the powers of self-determination and self-efficacy of perpetrators in their process of (self)change. Hence, it attributes an active role to perpetrators within the reconstruction of their individual and social lives.

Beyond valuing a person's capacity for change, social rehabilitation acknowledges the holistic (i.e., social) dimension of the individual. Social rehabilitation recognizes that individual change can hardly occur on its own or without the necessary motivation and support. Thus, social rehabilitation highlights the importance for people in prison to maintain or develop positive social bonds and relationships that may encourage feelings of belongingness and consequently motivate them to act in prosocial ways.

Altogether, the aim of the socio-rehabilitative approach is to reintegrate the perpetrator "by tackling not only individual behaviour but also social and structural advantages relevant to him or her, which include social bonds, employment, education, and other benefits" (Ashworth et al. 2009: 4). To this end, social rehabilitation values and hinges on the power of human connections to motivate individuals to change and live socially as law-abiding citizens.

When applying the lens of social rehabilitation, prison becomes a venue of dialogue, support, cooperation, and accountability wherein an individual can feel prompted to assume actual responsibility for his or her misbehavior and find constructive ways to enact and be motivated to achieve positive change. A prison that adheres to this ideal can give its residents the chance to value the positive aspects of their social identities with the necessary social and emotional support in a humane context. Overall, a prison that pursues the goals of social rehabilitation provides perpetrators with the appropriate conditions to feel motivated to change and live as law-abiding citizens.

Nevertheless, adapting the philosophy and dynamics of prison life implies neither a denial of people's criminal responsibility nor a reduction of the legal and social gravity of certain behaviors. As Pickard has rightly claimed, "we can aim to hold people

responsible and to account in a way which supports people to change and so promotes crime reduction as well as actual rehabilitation and reform" (Pickard 2018:8). Hence, the proposed model of prison would still represent the imposition of consequences that are appropriate for the behavior in response to blameworthy conduct. However, it would not subject perpetrators to harsh treatment, stigma, or censure and exclusion from the community. On the contrary, such model is founded on a person's potential capacity as a responsible agent not only in regard to his or her past but also with respect to his or her present and future. It encourages offenders to acknowledge the wrongness of their conduct and endeavor to improve.

In view of the empirical evidence that has been canvassed in this chapter, such an approach is likely to be instrumental for successfully addressing people who are affected by the criminal justice system and, ultimately, for prompting and encouraging them to choose and pursue a life without crime. Claims to the contrary, which assert that prisons must punish individuals for their misdeeds in exclusionary conditions in order to be effective, are grounded in outdated intuitions. These intuitions, beyond having been proven inhumane, heavily ignore the (neuro)biology of people as dynamic social beings.

Conclusion

Prison, in its current conception, is dehumanizing. It determines the social death of a person and does not contribute to his or her social functioning. On the contrary, it seriously risks compromising such functioning and, consequently, the individual's reintegration. A prison that excludes, stigmatizes, or isolates poses inevitable risks for

individuals in terms of erasing their social identity, damaging their neurobiology, devastating their psychological well-being, and increasing the difficulty of their life in the community.

A prison system that considers the social needs of the people within it and acknowledges and stimulates their capacity for positive change may be vital to adequately addressing crime and key to a truly efficient criminal justice system. Therefore, a radical reform of prisons into a system that empowers individuals to become active decision-makers in their change process while guaranteeing social relationships is warranted for the sake of individuals' social functioning and public safety.

After all, to "humanize" is to attribute universal human capacities to others (Haslam 2006), including the capacities to critically think about one's own behavior, admit one's own mistakes, experience the usual social emotions due to hurting someone else, and choose to take action to repair the negative consequences of his or her behavior and improve in the future. Essentially, "humanizing" refers to valuing the human dimension of the other, including his or her fallibility, and, simultaneously, his or her capacity to change.

Hence, a "humanized prison" is a place wherein a person can be motivated, encouraged, and supported to achieve positive change, value his or her social identity, and have a voice within his or her change process. Hence, it is a site that replaces the narrative and logics of exclusion, suffering, isolation with the values of dialogue, respect, re-engagement, support, and personal responsibility. The aim is to help individuals prepare for their re-entry into society as functional members.

I believe that "humanization" is the actual potential of social neuroscience for not only incarceration but also, and more broadly, criminal justice. Admittedly, social neuroscience alone cannot certainly dismantle centuries of theories of punishment. Moreover, neither social neuroscience nor any other empirical science can define the ultimate goal of punishment. Nevertheless, I argue that social neuroscience can significantly, though indirectly, contribute to making criminal justice more humane by educating the law and public about the importance of social relationships and positive environments for fostering positive behavioral change. To this end, it can provide a different narrative of wrongdoing and responses to it that values social and emotional support as well as the empowerment of the individual. This approach would encourage alternative ways of addressing crime that reject isolation, stigma, and social exclusion.

Critics may object that prison is intended to respond to "certainty-of-punishment" needs and lay people's demands or is not designed for comfort given the reasons for incarceration. Yet, I find it bizarre that despite so much progress in understanding human behavior and social relationships over the centuries, humankind has not been able to imagine any approach beyond the use of cages, cells, and bars to lock other humans up and treat them as if they are ferocious creatures that should be feared. The time is ripe for criminal justice to embrace the progress of the empirical sciences in clarifying the dynamics of social behavior and take action to reduce the gap between "us" and "them" (Garland 2001:135) by implementing alternative modes of addressing crime. Maintaining this gap only fuels (too often) ill-founded fears without offering any resolution for them.

References

Ashker et al. v. Governor of the State of California et al., 4:09-cv-05796-cw (N.D. Cal. 2014).

Ayer S.M. et al. (2014) "Exposure to Violence Predicting Cortisol Response During Adolescence and Early Adulthood: Understanding Moderating Factors," *Journal of Youth Adolescence* 1066–79.

Ashworth, A. et al. (eds.) (2009). *Principled Sentencing: Readings on Theory and Policy 3rd ed.* Portland: Hart Publishing.

Baskin-Sommers, A., Fonteneau, K. (2016) "Correctional Change Through Neuroscience," *Fordham Law Review* 423-36.

Baumeister, R., Leary, M. (1995) "The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation," *Psychological Bulletin* 497-529.

Bennion, E. (2015) "*Banning the Bing*: *Why Extreme Solitary Confinement is Cruel and Far Too Usual*," Indiana Law Journal 741-86.

Bessler, J. (2016) "The Italian Enlightenment and the American Revolution: Cesare Beccaria's Forgotten Influence on American Law," *Mitchell Hamline Law Journal of Public Policy and Practice* 1-184.

Braswell, M. et al. (2001) *Corrections, Peacemaking and Restorative Justice: Transforming Individuals and Institutions*, New York: Routledge.

Brenmer, J.D. (2006) "Traumatic Stress: Effects on the Brain," *Dialogues in Clinical Neuroscience* 445-61.

Cacioppo J.T. et al. (2009), "In the Eye of The Beholder: Individual Differences in Perceived Social Isolation Predict Regional Brain Activation to Social Stimuli," *Journal of Cognitive Neuroscience* 83-92.

Coppola, F. (2019) "The Brain in Solitude: An(other) Eighth Amendment Challenge to Solitary Confinement," *Journal of Law and the Biosciences* DOI: DOI: 10.1093/jlb/lsz014.

Cozolino, L. (2014) *Neuroscience of Human Relationships: Attachment and the Developing Social Brain* 2nd ed., New York: W.W. Norton & Company.

Davidson, R., McEwen, B. (2012) "Social Influences on Neuroplasticity: Stress and Interventions to Promote Well-being," *Nature Neuroscience* 689-95.

Dhami, N. et al. (2009) "Restorative Justice in Prisons," *Contemporary Justice Review: Issues in Criminal, Social, and Restorative Justice* 433-38.

Djordjevic, J. et al. (2012) "Effects of Chronic Social Isolation on Wistar Rat Behavior and Brain Plasticity Markers," *Neuropsychobiology* 112-19.

Dunbar, R. (1998) "The Social Brain Hypothesis," *Evolutionary Anthropology* 178-90.

Eisenberger, N. (2012a) "The Neural Bases of Social Pain: Evidence for Shared Representations with Physical Pain," *Psychosomatic Medicine* 126-35.

---- (2012b) "The Pain of Social Disconnection: Examining the Shared Neural Underpinnings of Physical and Social Pain," *Nature Reviews of Neuroscience* 421-34.

Farmer v. Brennan, 511 U.S. 825 (1994).

Fone, K., Porkess, M.V. (2008) "Behavioural and Neurochemical Effects of Post-weaning Social Isolation in Rodents—Relevance to Developmental Neuropsychiatric Disorders," *Neuroscience & Biobehavioral Review* 1087-102.
Foucault, M. (1977) *Discipline and Punish: The Birth of the Prison,* New York: Vintage Books.
Fowler, C. et al. (2008) "Estrogen Adult Neurogenesis in the Amygdala and Hypothalamus," *Brain Research Review* 342-51.
Feasey, S., Williams, P. (2009) "An Evaluation of the Sycamore Tree Programme: Based on an Analysis of Crime Pics II Data," at http://shura.shu.ac.uk/1000/1/fulltext.pdf.
Garbarino, J. et al. (2002) "Mitigating the Effects of Gun Violence on Children and Youth," *The Future of Children* 73–85.
Garland, D. (2001) *The Culture of Control: Crime and Social Order in Contemporary Society*, New York: Oxford University Press.
Gee D.G. et al. (2013) "Early Developmental Emergency of Human Amygdala-Prefrontal Connectivity After Maternal Deprivation," *PNAS* 15638-43.
Gilligan, J. (2000) "Punishment and Violence: Is Criminal Law Based on a Huge Mistake?," *Social Research* 745–72.
Goleman, D. (2006) *Social Intelligence: The New Science of Human Relationships*, New York: Arrow Books.
Gregg v. Georgia, 428 U.S. 153 (1976).
Johnson, C. (2013) "The Effects of Imprisonment," in F. Cullen and P. Wilcox (eds.) *The Oxford Handbook of Criminological Theory and Criminal Justice*, New York: Oxford University Press.
Haney, C. (2012) "Psychological Effects of Imprisonment," in J. Petersilia and K. Reitz (eds.), *The Oxford Handbook of Sentencing and Corrections*, New York: Oxford University Press.
---- (2018) "Restricting the Use of Solitary Confinement," *Annual Review of Criminology* 285-310.
Hart, H., Rubia, K. (2012) "Neuroimaging of Child Abuse: A Critical Review," *Frontiers in Human Neuroscience* 1–24.
Haslam, N. (2014) "Dehumanization: An Integrative Review," *Personality and Social Psychology Review* 252-64.
Hari, R. et al. (2015) "Centrality of Social Interaction for Adult Brain Plasticity," *Neuron* 181-93.
House, J.S. et al. (1988) "Social Relationships and Health," *Science* 540-45.
Ieraci, A. et al. (2016) "Social Isolation Stress Induces Anxious-Depressive-Like Behavior and Alterations of Neuroplasticity-Related Genes in Adult Male Mice," *Neural Plasticity* DOI: 10.1155/2016/6212983.
Kelly, M. et al. (2017) "The Impact of Social Activities, Social Networks, Social Support and Social Relationships on the Cognitive Functioning of Healthy Older Adults: A Systematic Review," *Systematic Reviews* DOI: 10.1186/s13643-017-0632-2.
Kupers, T. (2017) *Solitary: The Inside Story of Supermax Isolation and How We Can Abolish It*, Oakland: University of California Press.

Labrecque, R. (2016) "The Use of Administrative Segregation and Its Function in the Institutional Setting," in National Institute of Justice 2503157, *Restrictive Housing in the U.S.: Issues Challenges and Future Directions,* Washington, D.C.: U.S. Department of Justice.

Landa, A., et al. (2012) "Somatoform Pain: A Developmental Theory and Translational Research Review," *Psychosomatic Medicine* 717–27.

Lauwaert, K., Aertsen, I. (eds.) (2015) "Desistance and Restorative Justice: Mechanisms for Desisting from Crime within Restorative Justice Practices," *European Justice Forum.*

Lieberman, M. (2013) *Social: Why Our Brains Are Wired to Connect*, New York: Crown.

Lieberman, M., Eisenberger, N. (2008), "The Pains and Pleasures of Social Life: A Social Neuroscience Approach," *Neuroleadership Journal,* at http://www.scn.ucla.edu/pdf/Pains&Pleasures(2008).pdf.

Lippke, R. (2003) "Retribution and Incarceration," *Public Affairs Quarterly* 29–48.

Liu, J. et al. (2012) "Impaired Adult Myelination in the Prefrontal Cortex of Socially Isolated Mice," *Nature Neuroscience* 1621-23.

Lobel, J. (2008) "Prolonged Solitary Confinement," *University of Pennsylvania Journal of Constitutional Law* 115-38.

Lobel, J., Akil, H. (2018) "Law & Neuroscience: The Case of Solitary Confinement," *Daedalus* 61-75.

Logue, M.W. et al. (2018) "Smaller Hippocampal Volume in Posttraumatic Stress Disorder: A Multisite ENIGMA-PGC Study: Subcortical Volumetry Results from Posttraumatic Stress Disorder Consortia," *Biological Psychiatry* 244-53.

Makinodan, M. et al. (2012) "A Critical Period for Social Experience-dependent Oligodendrocyte Maturation and Myelination," *Science* 1357-60.

Maruna, S. (2016) "Desistance and Restorative Justice: It's Now or Never," *Restorative Justice: An International Journal* 289–301.

Matter, L. (2010-2011) "Hey, I Think We're Unconstitutionally Alone Now: The Eighth Amendment Protects Social Interaction as a Basic Human Need," *Journal of Gender, Race & Justice* 265-99.

McCrory, E. et al. (2010) "The Neurobiology and Genetics of Maltreatment and Adversity," *Journal of Child Psychology and Psychiatry* 1079–95.

Meijers, J. et al. (2018) "Reduced Self-Control After 3 Months of Imprisonment: A Pilot Study," *Frontiers in Psychology* DOI: 10.3389/fpsyg.2018.00069.

Nee C., Verhnam, Z. (2017), "Expertise and Its Contribution to the Notion of Protective Factors in Offender Rehabilitation and Desistance," *Aggression and Violent Behavior* 37–44.

Neil, S. et al. (2018) "Enriched Environment Exposure Enhances Social Interactions and Oxytocin Responsiveness in Male Long-Evans Rats," *Frontiers in Behavioral Neuroscience* DOI:10.3389/fnbeh.2018.00198.

Ouanes, S., Popp, J. (2019) "High Cortisol and the Risk of Dementia and Alzheimer's Disease: A Review of the Literature," *Frontiers in Aging Neuroscience* DOI: 10.3389/fnagi.2019.00043.

Pickard, H. (2018) "Rethinking Justice: The Clinical Model of Responsibility Without Blame," *Howard League for Penal Reform-Early Academics Network Bulletin* 4-10.

Power, J., Bradley, L. (2017) "Neural plasticity across the lifespan," *Wiley Interdisciplinary Review of Developmental Biology* DOI: 10.1002/wdev.216.
Reisel, D. (2015) "Towards a Neuroscience of Morality," in T. Gavrielides (ed.) *The Psychology of Restorative Justice: Managing the Power from Within*, New York: Ashgate Publishing.
Rhodes v. Chapman 452 U.S. 337 (1981).
Rosenzweig, M.R., Bennett, E. L. (1972) "Cerebral Changes in Rats Exposed Individually to an Enriched Environment," *Journal of Comparative and Physiological Psychology* 304-13.
Seeman, T.E., McEwen, B.S. (1996) "Impact of social environment characteristics on neuroendocrine regulation," *Psychosomatic Medicine* 459-71.
Sheridan M. A. et al. (2012) "Variation in Neural Development as a Result of Exposure to Institutionalization Early in Childhood," *PNAS* 12927-32.
Siegel D. (2012) *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are*, New York: Guildford Press.
Slater, A., Cao, L. (2015) "A Protocol for Housing Mice in Enriched Environments," *Journal of Visualized Experiments* DOI: 10.3791/52874.
Tanaka, K. et al. (2010) "Juvenile social experience regulates central neuropeptides relevant to emotional and social behaviors," *Neuroscience* 1036–42.
Toews, B. (2006) *The Little Book of Restorative Justice for People in Prison: Rebuilding the Web of Relationships*, Intercourse (PA): Good Books.
Tost H. et al. (2015) "Environmental Influence in the Brain, Human Welfare and Mental Health," *Nature Neuroscience* 4121-31.
Umbach, R. et al. (2018) "Cognitive Decline as a Result of Incarceration and the Effects of a CBT/MT Intervention: A Cluster Randomized Controlled Trial," *Criminal Justice and Behavior* 31-55.
Valk, S. L. et al. (2017) "Structural Plasticity of The Social Brain: Differential Change After Socio-Affective and Cognitive Mental Training," *Science Advances* DOI: 10.1126/sciadv.1700489.
Vera Institute of Justice (2019) "Human Dignity and Prison Design", at https://www.vera.org/research/human-dignity-and-prison-design.
Wang, X. et al. (2014) "Social Support Moderates Stress Effects on Depression," *International Journal of Mental Health Systems* DOI:10.1186/1752-4458-8-41.
Whittle, S. et al. (2014) "Positive parenting predicts the development of adolescent brain structure: A longitudinal study," *Developmental Cognitive Neuroscience* 7-17.
Wilkerson v. Stalder, 639 F. Supp. 2d 654 (M.D. La. 2007).
Wilson v. Seiter 501 U.S. 294 (1991).
Wongwitdecha, N., Marsden, C.A. (1996) "Social Isolation Increases Aggressive Behaviour and Alters the Effects of Diazepam in the Rat Social Interaction Test," *Behavioral Brain Research* 27-32.
Woo C. et al. (2014), "Separate Neural Representations for Physical Pain and Social Rejection," *Nature Communications* DOI: 10.1038/ncomms6380.

Biographical note

Federica Coppola, JD, PhD, is a Presidential Scholar in Society & Neuroscience and a lecturer in Criminal Law & Neuroscience at Columbia University in the City of New York. She studies the implications of social and affective neuroscience for substantive criminal law and criminal justice. Her first book *The Emotional Brain and the Guilty Mind: A Novel Paradigm of Criminal Culpability* is forthcoming from Hart Publishing.