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# The Effects of Solitary Confinement on Prison Inmates: A Brief History and Review of the Literature

## ABSTRACT

The effects of solitary confinement have been debated since at least the middle of the nineteenth century when both Americans and Europeans began to question the then-widespread use of solitary confinement of convicted offenders. A sizable and impressively sophisticated literature, now largely forgotten, accumulated for more than a half century and documented significant damage to prisoners. More recently the development of supermax prisons in the United States and human rights objections to pre-trial solitary confinement in Scandinavia revived interest in the topic and controversy over the findings. The weight of the modern evidence concurs with the findings of earlier research: whether and how isolation damages people depends on duration and circumstances and is mediated by prisoners' individual characteristics; but for many prisoners, the adverse effects are substantial.

The use of solitary confinement can be traced far back<sup>1</sup> but became common with the rise of the modern penitentiary during the first half of the nineteenth century. The practice of isolating individual prisoners has changed significantly since then but has remained a feature of

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<sup>1</sup> Perhaps to the monastic practice of imprisonment during the Middle Ages: so-called *murus strictus* or "close confinement," e.g., seems to indicate imprisonment akin to solitary confinement (Peters 1998, p. 26).

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Western prison systems. A debate about the effects of solitary confinement was largely settled early in the twentieth century, when the use of large-scale solitary confinement appeared to be on the way out in most Western prison systems. Discussions on the effects of solitary confinement resurfaced in the 1950s when sensory deprivation and perceptual deprivation studies were carried out partly in reaction to stories of brainwashing of U.S. prisoners of war (POWs) during the Korean War. These studies waned by the early 1970s. During the 1980s solitary confinement again regained topicality when supermax prisons caused an explosion in the use of solitary confinement. Probably much less known, pretrial solitary confinement has for many years been an integral part of Scandinavian prison practice and has in recent decades been considered a significant problem. Amnesty International and other human rights organizations regularly report on uses of isolation in prisons elsewhere: for example, in Turkey (Human Rights Watch 2001; Amnesty International 2003), Iran (Human Rights Watch 2004*a*), and Tunisia (Human Rights Watch 2004*b*). The use of isolation in connection with interrogations and the current “war on terrorism” is also well known. According to an official U.S. report, “isolation for up to 30 days” has been used at Guantanamo, and isolations “for long periods of time” have been used in Afghanistan (Schlesinger et al. 2004, p. 68; Greenberg and Dratel 2005, p. 227). Use of long-term isolation at Guantanamo has also been reported—eleven months in the case of Salim Ahmed Hamdan (Brief of Amici Curiae Human Rights First et al., *Hamdan v. Rumsfeld*, 546 U.S. 05-184 [2005], p. 15).

Solitary confinement is occasionally used in most prison systems as a means to maintain prison order: as disciplinary punishment or as an administrative measure for inmates who are considered an escape risk or a risk to themselves or to prison order in general. Some inmates, for example, sex offenders, choose voluntary isolation to avoid harassment from other prisoners. Finally, solitary confinement can be used in remand prisons to prevent pretrial detainees from tampering with witnesses or to force out a confession.

*The American Supermax.* Supermax prisons began with an October 1983 lockdown in Marion Penitentiary in Illinois, following the killing of two prison guards in two different situations on the same day. This happened when the U.S. prison system had been struggling with a rise

in prison violence for more than a decade (King 1999, p. 165).<sup>2</sup> In 1979 Marion had become the first level 6 “super-maximum security” prison in the United States (Pizarro and Stenius 2004, p. 250), but this regime was superseded in 1983 when the October lockdown was never lifted: inmates were confined to their cells without access to communal activities, and the use of solitary confinement as a tool used against disruptive prisoners became an ordinary measure.

The Marion lockdown regime (later termed “supermax”) inspired similar developments in many U.S. states. By 1997 there were fifty-five supermax facilities in thirty-four states, and in 1998 around 20,000 people were held in supermax facilities, compared to fewer than fifty prisoners held in the very highest security or close supervision centers in England and Wales in 1999 (King 1999, p. 164; Pizarro and Stenius 2004, p. 251). Today there are at least fifty-seven supermax prisons/units in the United States (Brief of Amici Curiae Human Rights Watch et al., *Wilkinson v. Austin*, 545 U.S. 04-495 [2005], p. 8). Rhodes (2004) counts more than sixty U.S. supermax facilities.

Supermax conditions typically include solitary confinement twenty-three hours each day in a barren environment, under constant high-tech surveillance. Inmates are sometimes able to shout to each other but otherwise have no social contact. Most verbal communication with prison staff takes place through intercom systems (Pizarro and Stenius 2004, p. 251). Communication with the outside world is minimal. Visits and phone calls are infrequent and are severely restricted if allowed at all. Visits sometimes take place only via video screens (Kurki and Morris 2001, p. 389). The physical contact available to an inmate in a supermax facility may for several years “be limited to being touched through a security door by a correctional officer while being placed in restraints or having restraints removed” (Riveland 1999, p. 11). These facilities typically claim to operate a regime of behavior modification, but most provide few program activities such as work or education.

A primary rationale for supermax prisons has been to lower the level of violence in prison systems. Recent research, however, suggests that supermax prisons do not fulfill that objective. A study of facilities in three different U.S. states concludes that “the effectiveness of supermax prisons as a mechanism to enhance prison safety remains largely speculative” (Briggs, Sundt, and Castellano 2003, p. 1371). Despite these

<sup>2</sup> The term “marionization of American prisons” has been used; see Immariageon (1992, p. 1).

findings and despite the extreme nature of supermax regimes, “the arguments given on behalf of such facilities are few in number and almost embarrassingly brief” (Lipke 2004, p. 109).

Supermax prisons, their practices and institutional cultures, and the effects of solitary confinement have been the focus of a number of court cases. Recently the way that prisoners are allocated to supermax prisons has been challenged as a violation of due process (*Wilkinson v. Austin*, 545 U.S. 495 [2005]), but most cases have been concerned with the conditions of imprisonment. There has been a “general refusal of courts to find isolated confinement unconstitutional absent aggravating circumstances,” although specific conditions in specific facilities have been found to violate the Eighth Amendment of the U.S. Constitution (banning “cruel and unusual punishment”) (Boston 2000, p. 4). Several U.S. courts have severely criticized conditions in supermax prisons, but long-term isolation as such has not been declared illegal (*Madrid v. Gomez*, 889 F. Supp. 1146 [N.D. Cal. 1995]; King 1999). According to Hans Toch (2002*b*, p. 16), “courts have hesitated to tell prison administrators that conditions of confinement in their supermax or control units are constitutionally impermissible or unacceptable, even where judicial dicta reek of personal disapproval of such conditions.” One reason might be that while the courts feel confident in scrutinizing the physical conditions of imprisonment, they “are hesitant to consider the psychological impact on the prisoner” (Luise 1989, p. 302).

*Scandinavian Pretrial Confinement.* Solitary pretrial confinement in Denmark was originally adopted following the Danish 1846 jail regulations, which prescribed the construction of single cells in jails nationwide. By the 1870s, most Danish jails were able to isolate their remand prisoners. This practice continued more or less unchanged during the next 100 years. Since the 1970s the use of solitary confinement in pretrial detention (also called “remand”) has declined, but it remains a feature of Danish prison practice. The original rationales were moral (remand prisoners should not be demoralized by each other’s company) and practical (to avoid possibilities of collusion, detainees were not allowed to interfere with the investigation), but the moral rationale was abandoned during the twentieth century. Conditions faced by isolated Danish remand prisoners today are very different from those of their U.S. supermax counterparts and would probably be considered much more humane by most observers.<sup>3</sup>

<sup>3</sup> Still, an isolation cell in a typical Danish remand prison is a barren environment of

In 1977 the Danish isolation practice was “rediscovered” after years of unquestioned use; decades of heated debate followed (Koch and Petersen 1988, p. 69). During 1978–79 at least sixty-four articles about solitary confinement appeared in two national newspapers, and during 1980–81 at least sixty articles appeared in three national newspapers. Writers included politicians, lawyers, doctors, psychologists, chaplains, nongovernmental organizations, prisoners, the Danish police, and the Danish Prison Service.<sup>4</sup>

Solitary confinement in Danish remand prisons has received substantial international criticism. In 1980 and 1983 Amnesty International criticized the use of solitary confinement in Denmark (Koch and Petersen 1988, p. 80), and international criticisms grew stronger during the 1990s. Two key actors were the European Committee for the Prevention of Torture (CPT) and the Committee against Torture (CAT). In 1997, CAT recommended that “the use of solitary confinement be abolished, particularly during pre-trial detention, or at least that it should be strictly and specifically regulated by law (maximum duration, etc.) and that judicial supervision should be introduced” (Committee against Torture 1997, paras. 171–88). The CPT visited Denmark in 1990, 1996, and 2002, each time critically raising issues concerning solitary confinement. In 1990 CPT stated that solitary confinement should be used only in “exceptional circumstances.” In 1996 CPT called for an increase in meaningful social contact for isolated inmates, and this recommendation was elaborated in 2002 (see visit reports at <http://www.cpt.coe.int/en/>).

The earlier Danish controversy in 1978 led to a law that subjected solitary confinement of remand prisoners to judicial review. The police, however, simply had to invoke a “reason for the detention in remand” to explain why the detained individual should be isolated (Danish Ministry of Justice 1983, p. 21). In effect, solitary confinement would normally be granted if the police argued that the accused could disturb

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six to eight square meters, which contains a bed, a chair, a cupboard, a shelf, and a sink. Radio and television can be allowed or disallowed according to the prisoner’s circumstances and the wishes of the police. Isolated remand prisoners normally spend around twenty-three hours in their cell each day and are allowed out daily in the exercise yard. This exercise takes place in isolation, e.g., in a six-meter-long triangular space.

<sup>4</sup> On the basis of an archive of newspaper clippings about solitary confinement, 1978–98, originally created by the so-called Isolation Group. The archive is now located at the DCISM library in Copenhagen.

the ongoing investigation. Forty-three percent of all Danish remand prisoners were isolated during 1979–82 (p. 88).

Further revisions in 1984 provided that isolation could be used to keep the detainee from disturbing the ongoing investigation. A proportionality principle was introduced under which the possible length of the period of isolation was connected to the severity of the charges. Remand prisoners could never be isolated for more than eight weeks unless the charges against them could result in imprisonment for six years or more.<sup>5</sup> The intention was to reduce the use of solitary confinement. This was achieved, and 21.5 percent of all remand prisoners were isolated in 1990 compared to 31.4 percent in 1984. But this was still a sizable number involving more than 1,000 imprisonments in isolation.

In 2000 a new law further elaborated the principle of proportionality and called for increased social contacts for inmates in solitary confinement. A so-called maximum limit of three months was introduced—“so-called” because it remains possible to isolate individuals for an unlimited time under special circumstances. It was (and is) possible to subject children under the age of eighteen to pretrial solitary confinement (Koch et al. 2003, p. 321).

During the late 1990s, use of pretrial isolation significantly declined (possibly inspired by the international critique), with 20.1 percent of all remand prisoners isolated in 1995 compared with 12.7 percent in 1999. The decline continued to 8.2 percent in 2002. There were still 501 pretrial imprisonments in a country with a population of 5.4 million and an average prison population of 3,435 inmates in 2002.<sup>6</sup> At the same time, though, the average length of a stay in pretrial solitary confinement has risen from twenty-seven days in 1988 to thirty-seven days in 2003 (Smith 2005, p. 12). The total number of days spent in pretrial solitary confinement has therefore gone up, and during 2003 and 2004 rose to a level beyond the situation in 2000.

Danish use of isolation in remand prisons became topical again during 2004. The European Court of Human Rights (ECHR) accepted a case in which the Danish state was charged with breaching article 3 of

<sup>5</sup> It has been pointed out that it is problematic to apply the principle of proportionality in connection with remand prisoners who are still to be considered not guilty; the question is how pain can be applied and graduated according to a possibly nonexistent offense (Koch et al. 2003, p. 320).

<sup>6</sup> See figures and tables in *Rigsadvokaten Informerer*, no. 21/2003 (<http://www.rigsadvokaten.dk/>).

the European Convention on Human Rights: “No one shall be subjected to torture or to inhuman or degrading treatment or punishment” (1950)—a case that was concerned with the effects of solitary confinement. In December 1994 a Danish citizen was arrested at Copenhagen airport, charged with drug trafficking, and sent into solitary confinement in Denmark’s largest remand prison. There he spent almost a year while the police investigated the matter. In November 1995, the Copenhagen city court lifted the isolation after the accused had supplied the police and the court with a version of the story that they believed. The detainee had difficulty leaving solitary confinement and stayed in voluntary isolation for two more weeks, after which he was transferred to communal prison detention. In May 1996 he was acquitted of the drug offenses but convicted for tax fraud. It was later discovered that the accused had become insane (paranoid psychotic) during his stay in solitary—a finding on which the Danish Supreme Court, the Danish Legal-Psychiatric Clinic, and the accused concurred. A claim for compensation went through the Danish court system. In the end the Danish Supreme Court offered economic compensation but refused to label his treatment as torture or inhuman or degrading treatment (*Robde v. Denmark*, the European Court of Human Rights Series A no. 69332/01 [2003]). On July 21, 2005, the ECHR ruled with four votes against three that there had been no violation of article 3. The three dissenting judges argued that the Copenhagen city court (and on appeal the High Court) never explained why it was necessary to isolate the accused and thought it “noteworthy” (*Robde v. Denmark*, p. 38) that solitary confinement was lifted as soon as the applicant had confessed his involvement in the case. They furthermore pointed out that “no psychological or psychiatric examination was carried out of the applicant” (p. 39) for the last ten months of his isolation, although the effects of solitary confinement were well known, and concluded that Denmark had indeed violated article 3 (*Robde v. Denmark*, European Court of Human Rights Series A no. 69332/01 [2005]).<sup>7</sup> I wrote a report on “The Effects of Solitary Confinement on Prison Inmates” for the prosecution in that case, which formed a starting point for this essay.

Sweden, Norway, and Iceland also have a recent history of extensive

<sup>7</sup> This and another recent judgment suggest that the ECHR is finding it difficult to adopt a line in cases concerning the use of solitary confinement in prisons. See Ramirez Sanchez v. France (59450/00), where three out of seven judges also dissented.

use of solitary confinement of remand prisoners—along lines similar to those in Denmark—and have likewise received international criticism from human rights organizations (Smith 2005). As in Denmark, national criticism has been voiced in Norway (although with less intensity). Yngve Hammerlin has described remand imprisonment and isolation in Norway as a “significant ethical problem for the Government services and the rule of law” (2001, p. 19; author’s translation) and has found this practice to be in violation of the official principles of the Norwegian Prison Service (p. 20). The Norwegian Prison Service has itself started working seriously toward a better remand practice, but the use of isolation remains a problem (see, e.g., Danielsen and Hansen 2002).

Though several other countries have limited provisions for isolating remand prisoners to avoid collusion, the routine use of pretrial solitary confinement has been termed a Scandinavian phenomenon (Evans and Morgan 1998, p. 247). Rod Morgan has compared this Scandinavian practice with the use of so-called moderate psychological pressure against detained suspects in Israel. He describes how Scandinavian media in 1999 “joyfully published” news of how this practice, which they described as “a euphemism for torture,” had been declared illegal by the Israeli Supreme Court. Morgan asked (in a Norwegian journal), “can Scandinavia in general, and Norway in particular, be so self-righteous and complacent? If torture involves the purposive imposition of severe pain in order to gather evidence—confessions, information about accomplices—do you not also torture?” (Morgan 1999, p. 201).

*A Definition of Solitary Confinement.* Conditions of solitary confinement vary significantly. In this essay the term solitary confinement refers to physical isolation of individuals in which they are confined in their cells for around twenty-three hours each day (typically twenty-two to twenty-four hours). The amount of contact with prison staff can vary and may constitute more than an hour each day, but only rarely will this contact be socially and psychologically meaningful. Contact with prison staff typically takes place in connection with being escorted to the exercise yard or the toilet or through brief encounters when meals are delivered to the cell door. Complete and total isolation is not practiced anywhere. In that sense, solitary confinement constitutes individual social isolation (and perhaps perceptual deprivation) rather than sensory deprivation (Volkart, Dittrich, et al. 1983, p. 27). In many so-called supermax prisons in the United States, it is possible

for inmates to communicate by shouting to each other. In many other isolation prisons, various methods can be used such as knocking on walls or lowering strings with messages from cell windows (concerning other definitions of solitary confinement, see Haney and Lynch [1997, p. 496]).

The key factor is that socially and psychologically meaningful contact is reduced to a minimum (Andersen 2004, p. 41). The reduction in stimuli is not only quantitative but also qualitative. The available stimuli and the occasional social contacts are seldom freely chosen, are generally monotonous, and are not typically empathetic.

*Sources of Knowledge.* This essay draws on a large number of very diverse sources. They can be grouped into the following categories:

- historical texts of various kinds including nineteenth-century books, articles, and treatises concerning solitary confinement (mainly from the United States, the United Kingdom, and Scandinavia);
- archival materials, principally nineteenth-century material from the Danish Vridsløselille Penitentiary;
- research on sensory deprivation and perceptual deprivation, but this work is treated only briefly;
- post–World War II professional studies of solitary confinement in prisons (and studies of prison health)—ranging from qualitative research with in-depth interviews to randomized medical studies with control groups; and
- a number of related studies concerning isolation of POWs, hostages, and comparable situations, but they are referred to only occasionally.

These sources are based on different and divergent conceptions of history, social science, science, and methodology and can be interpreted in diverse ways. A review of this kind calls for an interdisciplinary approach, which can encompass and use research of many kinds. It is my modest hope that such an approach can help “mend and mind the misconceived gap between science and the humanities,” which seems to have played a part in the debate over solitary confinement.<sup>8</sup>

A number of methodological issues are discussed throughout the

<sup>8</sup>This is a play on words from Stephen Jay Gould, whose last book after his death in 2002 bears the title *The Hedgehog, the Fox, and the Magister's Pox: Mending and Minding the Misconceived Gap between Science and the Humanities* (2003).

essay, but two issues are preliminarily discussed here: first, study designs and methodology and, second, the establishment of base expectancy rates for mental illness in general prison populations, in remand prisons, and in maximum-security confinement.

*Methodological Issues.* In 1995 Bonta and Gendreau stated that “careful empirical evaluations” had “failed to uncover . . . pervasive negative effects of incarceration” in general, and they criticized others for not believing objective quantitative data (1995, p. 76). When dealing specifically with solitary confinement Bonta and Gendreau referred to what they called an “extensive experimental literature,” usually involving laboratory research with volunteer college students who were subjected to short periods of solitary confinement or sensory deprivation. This research revealed “few detrimental effects,” whereas two studies of solitary confinement in prisons, which did report effects, used no “objective measures or control groups” (p. 85). In 1982 Suedfeld and colleagues voiced similar views and criticized much research on solitary confinement for being politically biased. The authors concluded that “outside observers tend to exhibit sympathy more than empiricism and objectivity” (Suedfeld et al. 1982, pp. 307–8).

Haney and Lynch chose a different approach. “In the absence of a single, definitive piece of research that effectively establishes a causal connection, we rely upon the method of ‘triangulation’ wherein we systematically review available research from numerous diverse sources, each of which addresses some of the ways in which solitary confinement and punitive segregation may affect prisoners” (Haney and Lynch 1997, p. 498). They argued that crucial information would be lost by narrowing the scope of inquiry as Bonta and Gendreau did (p. 498). Haney and Lynch found, as several had done before them, that the experimental literature on sensory deprivation reported many negative effects (pp. 500–503).

Others have made similar points (e.g., Grassian and Friedman 1986; Jackson 2002). Jackson argued that Bonta and Gendreau lost sight of reality in prisons when defining their “objective” measures, and they concluded that their work on solitary confinement was “quite irrelevant to the real-life experience of prisoners” (sector 4, chap. 3). According to Frank Porporino (2002, p. x), “prisons are real . . . [and] to study reality is bound to be more fruitful than to continue studying the contrived realities of the laboratory.”

Morris and Kurki (2001) concluded that the debate over the effects

of solitary confinement “seems to have more to do with different research methods, designs, and measures than with the effects of solitary confinement.” They emphasized that “when Bonta and Gendreau . . . did not find negative effects of solitary confinement, they referred to studies that used predominantly volunteer substitutes (often college students), limited solitary confinement to ten days or less, and typically excluded from experiments persons with any existing medical, psychiatric, behavioral, or intelligence problems” (p. 413). Jackson (2002) has argued similarly.

In this essay I try to bypass the “old” debate over sensory deprivation studies and experimental studies involving college students and to satisfy the criteria set out by both sides in the debate. Sizable numbers of quantitative research and qualitative studies are available, especially when one deals not only with North American research but also European. Studies that score high on scientific scales have been produced in Denmark.

*Base Expectancy Rates.* When one is assessing effects of solitary confinement, especially mental health effects, it is important to include control groups of nonisolated prisoners in study designs; not all studies do. For background, I therefore devote a few pages to the prevalence of psychological suffering and mental disorders in prison populations in general. Such information cannot be easily compared across national borders or incorporated directly into solitary confinement studies, but it provides useful background information. It would be highly anachronistic to use this information, however, when dealing with nineteenth-century prisons, where much lower frequencies of mental disorders and psychological suffering were generally reported in prison populations. This is most likely because understandings and definitions of mental illness were different.

*General Prison Populations.* In 2002 a review of sixty-two psychiatric surveys including 22,790 prisoners in twelve different countries concluded that 3.7 percent of all male prisoners and 4 percent of all female prisoners had psychotic illness, and 10 percent of the male and 12 percent of the female prisoners suffered from a major depression. Respectively 65 percent and 42 percent had a personality disorder (Fazel and Danesh 2002). It was concluded “that the risks of having serious psychiatric disorders are substantially higher in prisoners than in the general population” (p. 548).

Another trademark of prison health, which is often treated as psy-

chiatric morbidity, is the very high prevalence of drug and alcohol abuse or dependence (Andersen 2004, p. 27). Alcohol abuse or dependence rates found in eighteen studies ranged from 50 percent to 66 percent in one group, with other studies reporting lower frequencies ranging from 9 percent to 17 percent. This difference might be explained by a gradual shift in abuse or dependence patterns away from alcohol toward drugs. Drug abuse or dependence was reported in eighteen studies with a prevalence rate of 24–61 percent, with one Finnish study reporting 6 percent (Andersen 2004, p. 27).

Not all psychological and psychiatric problems and disorders are significantly more prevalent in prisons. So-called mood disorders (i.e., disorders in the affective spectrum including depression, melancholy, and adjustment disorder) “are generally found with comparable or a little higher frequency in prison studies than in the general population” (Andersen 2004, p. 21), although the differences between studies are quite large, and several found a high prevalence of major depression (Fazel and Danesh 2002).

Andersen (2004) reviewed the recent literature on the prevalence of mental disorders in prison populations in various (primarily Western) countries and found a prevalence of psychiatric morbidity ranging from 46 percent to 88 percent among sentenced prisoners in North America and a prevalence of 37 percent and 57 percent in two European studies. In North American remand populations, two studies reported 70 percent and 94 percent, and European studies reported 62–76 percent (Andersen 2004, pp. 20–21). But these figures counted substance dependence or abuse as disorders, and when studies exclude dependence disorders, the figures drop significantly. In European remand populations, prevalence rates of psychiatric morbidity (excluding dependence) of 26 percent and 29 percent have been reported, and 32 percent was reported among sentenced prisoners in Canada (p. 20). Apart from indirectly confirming the very high degree of substance abuse problems, these figures suggest that there might be some differences between remand populations and sentenced populations. Differences between remand and sentenced populations were also found in Fazel and Danesh’s review of sixty-two surveys, but they were apparently not very significant (Fazel and Danesh 2002, p. 545).

Prevalence rates excluding substance abuse or dependence confirm findings from other studies reporting on prison health. According to a Danish study in which data were cross-referenced with the Central

Danish Psychiatric Register, 29 percent of all 8,403 Danish prisoners and criminals under penal supervision on November 3, 1992, had at some point been hospitalized for psychiatric treatment (Kramp 1993). But whether these people still suffered from mental disorders or problems was not assessed. A later Danish study concluded that 15 percent of all 2,689 sentenced inmates in Danish prisons on February 23, 1999, had been treated by or consulted a psychiatrist during their current imprisonment, whereas 24 percent at some point (before or during the imprisonment) had psychological and/or psychiatric problems (Kysvgaard 1999, vol. 2, pp. 41–42). A Norwegian study of 187 remand and sentenced prisoners reported that 21 percent were in need of psychiatric treatment (Gamman and Linaker 2000).

Research in U.S. prisons generally reveals similar or higher rates than those reported in European prisons. A report on offenders with mental disorders in U.S. correctional institutions in 1998 concluded “that somewhere between 8 and 19 percent of prisoners have significant psychiatric or functional disabilities and another 15 to 20 percent will require some form of psychiatric intervention during their incarceration” (Abramsky and Fellner 2003, p. 17). Two years later the American Psychiatric Association reported estimates that up to 20 percent of all prisoners “were seriously mentally ill” whereas up to 5 percent were “actively psychotic at any given moment” (p. 17). In 2002 the National Commission on Correctional Health Care estimated the prevalence of a number of mental disorders: “On any given day, between 2.3 and 3.9 percent of inmates in state prisons are estimated to have schizophrenia or other psychotic disorder, between 13.1 and 18.6 percent major depression, and between 2.1 and 4.3 percent bipolar disorder (manic episode). A substantial percentage of inmates exhibit symptoms of other disorders as well, including between 8.4 and 13.4 percent with dysthymia, between 22.0 and 30.1 percent with an anxiety disorder, and between 6.2 and 11.7 percent with posttraumatic stress disorder” (quoted from Abramsky and Fellner [2003, p. 17]).

Human Rights Watch furthermore reported that correctional services in individual states themselves report having between 11 percent and 16.5 percent mentally ill offenders in their prisons (Abramsky and Fellner 2003, p. 18).

*Remand Prisoners in Solitary Confinement.* When one is looking at the use of solitary confinement in relation to base expectancy rates, it is important to distinguish between remand prisoners (like those in

Scandinavia) and inmates in administrative or disciplinary segregation. There is likely to be a significant average mental health difference between remand prisoners isolated in order to protect an ongoing police investigation and prisoners who are in punitive or administrative segregation because they are considered disruptive or otherwise a danger to prison order. Danish and Norwegian data suggest that remand prisoners in solitary confinement in Denmark and Norway have slightly better base expectancy rates for psychological or psychiatric illnesses (as well as IQ) than average nonisolated remand prisoners (Andersen et al. 1994, p. 56; Gamman 1995, p. 2245; 2001, p. 45; Andersen 2004, p. 11). This difference has to do with the kinds of suspects who are isolated. They are often involved in organized crime (especially involving narcotics) and typically relatively complicated cases, and they have a slightly better psychological profile than the average remand prisoner. When one is studying isolated remand prisoners in Denmark, Norway, and Sweden, a similar or perhaps lower prevalence of psychiatric morbidity would normally be expected than among nonisolated remand prisoners.

*Sentenced Prisoners in Punitive or Administrative Segregation.* Segregation of sentenced prisoners is a different matter. When one is dealing with disruptive prisoners, higher rates of psychiatric disorders (and sometimes personality disorders) are found in both North American and European studies. Many prisoners bring psychiatric or psychological problems with them when entering segregation or isolation. Still there might be a difference between inmates in administrative and punitive segregation. A survey of disciplinary segregation in all prisons in England and Wales in fact concluded that there “was no evidence . . . that prisoners with severe mental illness were more likely to experience disciplinary segregation than other prisoners.” The “overall impression of segregated prisoners . . . [was] that they tend to be career criminals with personality disorder, together with additional features of emotional instability and impulsivity” (Coid et al. 2003*a*, p. 314). The situation was different among prisoners in so-called “strip” cells (on the basis of the same data as the above survey), which are used for “temporary confinement of a violent or refractory prisoner,” and not for punishment (Coid et al. 2003*b*, p. 321). The conclusion was that prisoners “with severe mental disorder, suicidal tendencies, and a history of deliberate self-injury were more likely to report having been placed in special (‘strip’) cell conditions” (p. 335).

A number of North American studies report different results, including a relatively higher level of psychological distress among inmates in disciplinary segregation than among inmates in the general population. In a correctional institution in Kentucky it was found among thirty-four inmates that “general psychological distress increases with the increase of restriction,” and inmates in disciplinary segregation reported more feelings of inadequacy, inferiority, withdrawal, and isolation than the general prison population, and more feelings, thoughts, and actions of rage, anger, and aggression than both the general prison population and those in administrative detention (Miller and Young 1997, pp. 91–92). A Canadian study of two segregation units involving seventy-three inmates reported that the rate of severe mental disorder was higher than in the general prison population. Especially schizophrenia and mania were overrepresented, whereas the rate of major depression was not. The study concluded “that mentally disordered inmates are being isolated within the penitentiaries . . . [without] receiving mental health care” (Hodgins and Côté 1991, p. 181). Abramsky and Fellner concluded that mentally ill prisoners in the United States generally are disproportionately confined in various lockdown, isolation, and segregation units, and they reported different state figures, ranging typically from 30 percent to more than 50 percent of inmates in such settings being mentally ill (2003, pp. 145–49).

While it is often very difficult to compare prison populations, prison conditions (segregation is not necessarily solitary confinement), and health issues across national borders, it is reasonable to conclude that significantly higher rates of psychiatric morbidity should be expected among prisoners in disciplinary or administrative segregation/isolation compared with the general prison population.

Here is how this essay is organized. Section I surveys the history of the use of solitary confinement as a penal measure, beginning with the initiation of the Pennsylvania model at Philadelphia’s Cherry Hill Prison early in the nineteenth century. Although adverse effects on prisoners’ mental health became evident relatively quickly and American prisons soon moved away from systematic, general use of solitary confinement, prisons in many countries adopted the Pennsylvania model and in a number of European countries continued to follow it well into the twentieth century, despite widespread evidence of its ad-

verse effects. Section I concludes with a brief overview of post–World War II research on the effects of sensory and perceptual deprivation.

Section II examines the modern literature on the mental health effects of isolation. Though a few studies reach discordant findings, the vast majority document significant negative health effects arising from solitary confinement, and several previous literature reviews in the United States and Scandinavia reach that conclusion.

So what are the adverse effects of solitary confinement? Section III surveys the findings concerning physiological, mental health, and personality effects and reviews the evidence on the extent to which the effects appear to be lasting. A wide range of adverse effects have been documented. After release, symptoms appear gradually to diminish for many people, but this like other questions of the long-term effects of imprisonment remains an underresearched subject.

Section IV discusses a number of policy issues isolation raises, including in particular its demonstrated nature as a risk factor in prison suicide and the effects of isolation on criminal prosecution and defendants' efforts to defend themselves. Although rationales for pretrial isolation include preventing defendants from tampering with evidence or witnesses, its effects often include pressuring defendants to plead guilty and impeding their efforts to defend themselves.

Section V, the conclusion, discusses policy implications of current knowledge of the effects of solitary confinement and discusses priority topics for future research.

### I. A Brief History of Solitary Confinement and Its Effects on Prison Inmates

The ideology of the modern prison system developed from the 1770s to the 1850s. With the construction of the Auburn and Pennsylvania prison models in the 1820s, the aim of the modern penitentiary system became rehabilitation of criminals through the use of isolation. The Auburn system (developed in the Auburn Prison in New York State) permitted inmates to work together during the day, but under a regime of total silence. No communication was permitted. In Pennsylvania model institutions (first developed in Philadelphia in the Cherry Hill Prison), there was no compromise with the ideal of isolation, and the prisoners spent all their time in the cell, where they also did their work. The inmate was expected to turn his thoughts inward, to meet God,

to repent his crimes, and eventually to return to society as a morally cleansed Christian citizen (see, e.g., Rothman 1971; Ignatieff 1978; Foucault 1995; Smith 2003, 2004b).

The ideology of the modern penitentiary—and the philosophy of rehabilitation through isolation—had an enormous impact. The American prisons were inspected by numerous visitors from Europe and South America during the 1830s, '40s, and '50s by official state delegations as well as interested experts and curious celebrities, and the vast majority praised the modern and impressive institutions. In the United States, the Auburn model became the more popular, whereas the Europeans favored the Pennsylvania system and therefore solitary confinement. Between 1830 and 1870, several hundred European jails and prisons were constructed (or modernized) on the basis of a system of social isolation. Hundreds of thousands of individuals were subjected to solitary confinement during the nineteenth century (Johnston 2000; Smith 2004b; concerning South America, see Salvatore and Aguirre [1996]).

#### *A. Nineteenth-Century Solitary Confinement and Its Effects on the Health of Prisoners*

The Auburn system in New York was preceded by a regime put into force in 1821 according to which inmates were completely isolated without work during the day. After eighteen months this system had produced “results so dire” that the governor of New York stopped the experiment after a visit, and 26 inmate “survivors” were immediately set free (Hess 1972, p. xiv). As a result, inmates were allowed to work together during daytime and the Auburn system became a reality.

It soon became apparent that mental health problems were arising in the Pennsylvania model prisons, where isolation was enforced much more strictly. During the initial years of the Cherry Hill Prison in Philadelphia, the resident physician denied the existence of any serious health problems, but later in the 1830s reports materialized<sup>9</sup> about mental disorders—including hallucinating prisoners, “dementia,” and “monomania.”

The reasons for the numerous cases of mental illness were disputed. Defenders of the Pennsylvania system claimed that solitary confine-

<sup>9</sup> See, e.g., the figures, text, and tables concerning mental disorders quoted in *Reports of the Prison Discipline Society of Boston* (1972): fourteenth report (1839, p. 50) and fifteenth report (1840, p. 40). See also Gray (1847, p. 90).

ment did not itself cause the problems. One 1846 report concluded that the disproportionately high number of cases of mental illness in Philadelphia's Cherry Hill Prison were caused by a high proportion of individuals from the "mulatto race" who apparently could not handle the confinement as well as "men of pure Saxon blood." It was considered especially noteworthy that these "mulatto" men were allegedly "very degraded" and "addicted to those sexual excesses which lead particularly to cerebral derangement" (Howe 1846, p. 76). This explanation reflected a widely held nineteenth-century theory that masturbation could cause insanity, as well as common racist views of the period (concerning masturbation and insanity, see Spitz [1952]). A physician at Cherry Hill was of the same opinion and ventured in the late 1830s that "the cases of mental disorder occurring in this Penitentiary are, with a few exceptions . . . caused by masturbation, and are mostly among the colored prisoners" (*Reports of the Prison Discipline Society of Boston* 1972 [fourteenth report, 1839, p. 49]). In Denmark, similar views were expressed during the early 1840s as a way of supporting the use of solitary confinement in Denmark—the argument being that isolation would not cause problems in Denmark since only white men would be incarcerated (Smith 2003, p. 141).

The Pennsylvania model was imported and used in many European nations, including France, England, Germany, Holland, Belgium, Portugal, Norway, Sweden, and Denmark (Morris and Rothman 1998; Nilsson 1999; Johnston 2000; Smith 2003). But the experts who had supported solitary confinement were proved wrong over and over again. When Millbank Prison in England introduced new rules in the 1830s in order to prevent communication between inmates and enforce solitary confinement, "cases of insanity began to appear," and by 1841 separation and isolation had to be limited to the first three months of each sentence (Henriques 1972, p. 76; Toch 2003, p. 225). The inspectors of Millbank complained in a report from 1841 "that a very extraordinary increase has taken place in the number of insane prisoners in the prison" (Laurie 1846, p. 3) and suggested that whenever treatment of insanity was needed the prisoners in question should be placed together and "have the privilege of conversation" (p. 4). In other words, isolation was characterized as the cause of mental illness. According to new 1841 regulations, prisoners after the initial three months were allowed to converse with two or more fellow inmates during exercise hours (Toch 2003, p. 225).

Support for the Pennsylvania model continued, and the ambitious Pentonville Prison in England initially operated in 1842 with a strict regime of solitary confinement during the first eighteen months of incarceration. Each year between five and fifteen inmates were taken away to asylums, and the period of isolation was subsequently reduced (Ignatieff 1978, p. 3). Solitary confinement of remand prisoners was also found in England during the 1840s. In Reading Gaol, Pentonville's regulations were displayed on the walls, and according to a critic, the same system of spirit-breaking solitude was applied (Vyvyan 1845).

Several Pennsylvania model prisons were constructed in Germany. Throughout the later half of the nineteenth century, a number of German psychiatrists described the negative health effects of solitary confinement in great detail (Nitsche and Wilmanns 1912).

Although some U.S. physicians focused on masturbation as the source of the problem, other U.S. physicians—like their German colleagues—described what they saw as a clear connection between solitary confinement and the health of inmates. In 1841, the physician in a New Jersey penitentiary constructed on the Pennsylvania plan concluded that “the opinions expressed heretofore on the effects of solitary confinement are strengthened by every year's experience. The more rigidly the plan is carried out, the more the spirit of the law is observed, the more its effects are visible upon the health of the convicts. A little more intercourse with each other, and a little more air in the yard, have the effects upon mind and body, that warmth has upon the thermometer, almost every degree of indulgence showing a corresponding rise in health of the individual” (*Reports of the Prison Discipline Society of Boston*, seventeenth report [1842, p. 60]).

The New Jersey Penitentiary physician complained about solitary confinement in many reports and described “many cases of insanity,” but suddenly problems with mental disorders ceased. This, he said, occurred because when a prisoner showed signs of disease, “if his mind begins to fail, and he shows symptoms of derangement, another convict is put with him in his cell. This invariably restores the patient” (*Reports of the Prison Discipline Society of Boston*, eighteenth report [1843, p. 82]; see also Gray 1847, p. 119). Solitary confinement was simply abandoned when problems arose. A similar conclusion was reached at the state prison in Rhode Island, where “symptoms of insanity” disappeared after convicts were allowed to work together (*Reports of the*

*Prison Discipline Society of Boston*, nineteenth report [1844, p. 63]; see also Gray 1847, p. 121).

When compared to reports from the Auburn model prison in Charlestown, Massachusetts, the official statistics from Cherry Hill did not aid the cause of solitary confinement. Death rates were significantly higher in Cherry Hill, and cases of regular insanity far outnumbered those in Charlestown (Gray 1847, pp. 106, 109).

In 1842, the English author Charles Dickens famously described and condemned solitary confinement after a visit to Cherry Hill:

I believe that very few men are capable of estimating the immense amount of torture and agony which this dreadful punishment, prolonged for years, inflicts upon the sufferers; and in guessing at it myself, and in reasoning from what I have seen written upon their faces, and what to my certain knowledge they feel within, I am only the more convinced that there is a depth of terrible endurance in it which none but the sufferers themselves can fathom, and which no man has a right to inflict upon his fellow-creature. I hold this slow and daily tampering with the mysteries of the brain, to be immeasurably worse than any torture of the body. (Dickens 1985, p. 146)

In 1851, the Danish fairy tale author Hans Christian Andersen visited a Swedish Pennsylvania model prison and described how “a silence deep as the grave rests over it. It is as though no one lived there or it was an abandoned house in time of plague. . . . Galleries run along the various storeys and, at the hub, the chaplain has his pulpit; where he holds his Sunday sermons for an invisible congregation. Door upon door of the cells is half-opened to the gallery. The prisoners hear the chaplain, but they cannot see him, nor he them. It is all a well-built machine, a nightmare for the spirit” (Andersen 1851, pp. 29–33; Smith 2004b).

The Dutch criminologist Herman Franke observed that the new isolation prisons produced severe problems wherever they were put into use: “Again and again reports of insanity, suicide, and the complete alienation of prisoners from social life seriously discredited the new form of punishment” (1992, p. 128).

Francis C. Gray’s impressive study of *Prison Discipline in America* reached the same conclusion in 1847. Gray’s study was based on statistical and qualitative evidence of the experiences with both Auburn and Pennsylvania model prisons. Gray concluded “that from the ex-

perience of our own country hitherto, it appears that the system of constant separation [solitary confinement according to the Pennsylvania model] as established here, even when administered with the utmost humanity, produces so many cases of insanity and of death as to indicate most clearly, that its general tendency is to enfeeble the body and the mind" (1847, p. 181).

Much of the Western literature on the origins of the modern penitentiary does not deal with the effects of solitary confinement but stresses the capacities of these institutions for controlling and influencing the minds of prisoners (see, e.g., Rothman 1971; Ignatieff 1978; Foucault 1995; Smith 2003, 2004*b*). Foucault and others have analyzed the new nineteenth-century prisons as examples of a modern technology of power that allowed for a more effective and individualized social control, aimed at controlling not only the bodies and actions of individuals but also their thoughts. Control was to be internalized in the individual. The new prisons therefore reflected a shift "from the body as object to the mind as object" (Spierenburg 1996, p. 31). Contemporaneous observers agreed. In the words of the English nineteenth-century prison chaplain at Preston House of Correction, John Clay, "A few months in the solitary cell renders prisoners strangely impressible. The chaplain can then make the brawny navy cry like a child; he can work on his feelings in any way he pleases. He can . . . photograph his thoughts, wishes, and opinions on his patient's mind, and fill his mouth with his own phrases and language" (Potter 1993, p. 46).

#### *B. Denmark, 1859 to the 1930s*

In Denmark, solitary confinement was implemented on a large scale beginning in 1859 when Vridsløselille Penitentiary, based on the Pennsylvania system, opened. During the early 1860s it became apparent that serious health problems had arisen. It quickly became normal procedure to transfer the worst inmates (who became more or less uncontrollable) to insane asylums in different parts of the country, and the prison authorities fought a constant battle to avoid a general state of mental health chaos. The prison staff quickly adopted a strategy, which meant that they broke the rules, by allowing individual prisoners special privileges, such as prolonged yard time or even the chance to work together with other inmates, in order to offset the effects of solitary confinement. The whole point of imprisonment according to the rationale of the modern prisons was to rehabilitate the incarcerated

criminals, and this was reflected in the creativity employed by the prison authorities to counter the effects of isolation (Smith 2004*a*).

Archival studies indicate that at least a third of the inmates reacted to isolation with adverse health effects, and at least a third of these (around 12 percent of the total prison population) might be characterized as suffering from major psychological and psychiatric problems including hallucinations, paranoia, and different kinds of personal degeneration. Prisoners with adverse health effects were typically described as healthy upon their entrance to the prison. The archived material allows for a longitudinal analysis of prisoner health, although the inmates still may have brought psychiatric problems with them into the prison (Smith 2004*a*).<sup>10</sup>

These nineteenth-century figures cannot be compared directly to recent studies of psychiatric morbidity in prisons. Vastly fewer prisoners were reported as psychiatrically or psychologically ill in nineteenth-century prisons (in Denmark at any rate) than today. Vridsløselille (for male prisoners) originally was considered a near-perfect and very modern prison in a medical and hygienic sense. It had central heating, and each prisoner had running water and a flushing toilet in his cell, which was quite unheard of in those days.

The first governor of Vridsløselille, Frederik Bruun, became a strong opponent of solitary confinement. According to Bruun, more than half of the inmates in long-term isolation (up to three and one-half years) were severely damaged, and the health situation was generally very problematic. Bruun concluded that prisoners in solitary confinement often fell into a state that resulted in “a total lack of energy and will power, in mental and physical laxity . . . which is either cured by means of fortifying medicine, a changed and improved diet, longer exercise spells or light work in the open air, or else gives way to depression and thence to higher degrees of mental disorder” (Smith 2004*a*, p. 18).

Bruun, who was also head of the Danish Prison Service, used statistics to describe how mental illness was more widespread in communal

<sup>10</sup> Another way of assessing reliability of these historical data is by comparing the situation in Vridsløselille with (the lack of) health problems in prisons without solitary confinement. In Horsens Penitentiary, which was constructed on the Auburn plan six years before Vridsløselille, the health of inmates never became a problem as in Vridsløselille. Some of the diseases found with a high prevalence in Vridsløselille were never recorded, or were recorded at much lower frequency, in Horsens. Diseases that appeared clearly related to solitary confinement.

prisons than among the free population, but even more common in cellular prisons than in communal prisons, and more so in cellular prisons in which total isolation was implemented (as in Vridsløselille) than those in which prisoners were allowed to mix in chapel, school, and exercise yards (Bruun 1867, p. 48). Bruun calculated that mentally ill Danes accounted for 0.108 percent of the total population, whereas the proportion of mentally ill in Vridsløselille from April 1863 to 1867 was estimated at 2.28 percent (those were the official figures; the archived material from the prison reveals that many more would be termed mentally ill according to contemporary standards). In addition, cellular prisons, according to Bruun, had higher frequencies of “abnormal states which are generally a precursor of mental illnesses.” With reference to data from the penitentiary in Christiania in Norway, it was declared that such states could include cerebral congestion, hypochondria, insomnia with and without anxiety, hallucinations, suspiciousness, despondency, and fixed ideas (Smith 2004a, p. 16).

Following this critique, a psychiatric study was carried out, and the findings were presented in 1871 in a report entitled *Cellestraffens Indvirkning paa Forbrydernes mentelle Sundhedstilstand* (The effect of solitary confinement on the mental health of prisoners), written by Christian Tryde, MD (Tryde 1871). He described a large number of cases of mental illness that had arisen in Vridsløselille and discussed their possible etiology. The cases were divided into three groups: those in which the illness was an element in a different somatic disease, those in which an attack of mental illness in the prison was due to a previous chronic cerebral disorder, and those found in prisoners who had not had any chronic complaint when they came to the penitentiary (Smith 2004a, p. 18).

Tryde was extremely careful about assigning the blame for cases of mental illness to the cellular system and isolation and found support in the biological notions of the time. For example, he stated that the brains of criminals were already encumbered at birth “with a pathological hereditary predisposition from a degenerate family,” and like others before him, Tryde cited masturbation as a cause of insanity. He nevertheless concluded that isolation could not be declared to be without blame “for having a harmful effect on the prisoner’s mental health” (Smith 2004a, p. 18).

Several of Tryde’s colleagues in Danish mental hospitals were more forthright in their conclusions. In those cases in which a transferred

prisoner was proclaimed healthy and was to be sent back to serve the rest of his sentence, several doctors advised explicitly against the resumption of isolation. A doctor at the mental hospital in Vordingborg declared of one prisoner, for example, that it was probable that “solitary confinement has been the most significant factor” behind the mental illness. Such discharged prisoners were typically sent to do communal labor at the penitentiary in Christianshavn (Smith 2004*a*, p. 18).

Solitary confinement continued to be used in Denmark, and the numerous mental health problems in Vridsløselille Penitentiary continued. As the discipline of psychiatry developed during the late nineteenth and early twentieth centuries, the mental disorders in Vridsløselille were given new names and old categories of illness disappeared. From 1878 to 1883, official reports concluded that of 1,921 prisoners in Vridsløselille who were healthy on arrival, 5.4 percent suffered from lethargy during their imprisonment, and 1.9 percent became insane; in addition, more than 5 percent suffered from other diseases that according to the Danish Prison Service were caused by the imprisonment, that is, solitary confinement. In Horsens Penitentiary (Denmark’s other modern penitentiary from 1853, which operated on the Auburn plan without solitary confinement during daytime), only 0.8 percent suffered from lethargy, and 0.62 percent became insane during imprisonment in the same period (*Beretninger fra Kontoret for Fængselsvæsenet* 1885).

During the late 1880s an illness termed *nervesmerter* (“neurological pains”) began to appear in increasing numbers in Vridsløselille, and cases of lethargy diminished (*Beretning fra Overinspektionen for Fængselsvæsenet* 1898). During 1911–12 the so-called *nervesmerter* had disappeared entirely, and only very few cases of lethargy were recorded. But at the same time a new mental disorder, “hysteria,” had arrived, which was recorded among more than 3 percent of the inmates. The next financial year around 2 percent of the isolated inmates in Vridsløselille suffered from hysteria, but once again, a new illness appeared. An amazing 9.94 percent of all prisoners in solitary confinement (contrary to 2.17 percent of the prisoners who were not isolated) suffered from *neuralgi* (“neuralgia”<sup>11</sup>). The following year, two new diseases arrived: melancholia and nervousness; but only a few prisoners

<sup>11</sup> Possibly related to “neurasthenia”—a so-called disease of the nervous system that became very “popular” during the late nineteenth century. See Wessely (1995, p. 509) and Köppe (2004).

suffered from these, whereas neuralgia was still reported among 7.64 percent of all isolated inmates. During 1914–15 a massive 13.77 percent of those in solitary confinement were treated for neuralgia (*Beretning om Straffeanstalterne i Danmark* 1913, 1914, 1915, 1916). A study of how nervous diseases, hysteria, neurasthenia, and related disorders were perceived in the late nineteenth century reveals that these disorders were associated with symptoms that today appear related to solitary confinement (Wessely 1995; Köppe 2004).

During the period 1911–15, neither hysteria, melancholia, nervousness, nor neuralgia was reported even once in Horsens Penitentiary. When solitary confinement was finally abandoned in Denmark around 1932–33, the cases of outright insanity in Vridsløselille Penitentiary completely stopped from one year to the other (*Beretning om Straffeanstalterne i Danmark* 1932, 1934, 1939).

### C. Solitary Confinement Internationally Condemned

From the 1860s onward a skeptical attitude evolved toward “rehabilitation through isolation,” and the ideology of the modern penitentiary faced a serious crisis. The founding nation of the modern prison systems—the United States—was among the first to abandon large-scale solitary confinement.<sup>12</sup> As explained by historian David Rothman, “By the 1860s, and even more obviously by the 1870s and 1880s, the unique arrangements of the Auburn and Pennsylvania plans had disappeared” (1998, p. 112). In France, the Pennsylvania model and solitary confinement “never got off the ground completely,” and only a few “cellular” prisons were in operation around 1880 (Franke 1992, p. 137). Other prison regime designs of course emerged, such as the Elmira Reformatory model for younger offenders in the United States, and gradually penitentiary discipline moved “from its earlier emphasis on isolation and work toward a more complex regime that facilitated individualized treatment” (Salvatore and Aguirre 1996, p. 7). Another prison system, which signaled a gradual transition away from the Pennsylvania model, was the so-called progressive system, which typically

<sup>12</sup> According to Johnston (2000, p. 138), all states that tried the Pennsylvania system abandoned this model after a few years—with the exception of Pennsylvania itself. He furthermore writes that “ironically, while Europe and, later, South America and Asia were building radial-plan prisons with cellular isolation, to be used at least in the initial phase of a sentence, the United States did not follow the example of Philadelphia’s Eastern State Penitentiary [the Pennsylvania system]” (p. 147). See also Haney and Lynch (1997, p. 487).

combined an initial limited phase of solitary confinement with a number of later stages involving social contact with other prisoners and attainment of different privileges (Bruun 1867, p. 21).

The transformation of the penitentiary had several causes, but one was most certainly the substantial health problems related to isolating inmates. In Germany, for example, a psychiatric literature on “prison psychoses” developed and expanded during the second half of the nineteenth century. One of the pioneers, Delbrück, described how absolute isolation had “a very injurious effect on the body and mind” and gave rise to hallucinations. Delbrück advised “the immediate termination of solitary confinement” (Nitsche and Wilmanns 1912, p. 7). These results were supported by another German psychiatrist, Gutsch, who between 1846 and 1860 studied eighty-four cases of mental disorder that had developed in solitary confinement. These disorders included a wide range of symptoms from emotional and depressive shocks, suicidal tendencies, and manic outbreaks to pathological delusions and hallucinations (p. 8). In 1912 Nitsche and Wilmanns concluded, on the basis of the work of Kirn, that the “acute hallucinatory melancholia” was a psychosis, which related specifically to solitary confinement (p. 74).

In another study, *Problems in Prison Psychiatry*, Wilson and Pescor concluded that the inmates in Pennsylvania model prisons “went insane instead of being reformed.” As a result, the authors continued optimistically, solitary confinement during both day and night was no longer practiced by any civilized nation (1939, p. 24).

This matter-of-fact attitude toward the mental health effects of solitary confinement seems to reflect a general consensus in some countries during the late nineteenth century and early twentieth century. This view was expressed by the U.S. Supreme Court in 1890, in a case concerning solitary confinement of a prisoner under sentence of death in the state of Colorado. The Supreme Court ruled that solitary confinement “was an additional punishment of the most important and painful character” and described how inmates had reacted to solitary confinement in U.S. nineteenth-century prisons: “A considerable number of prisoners fell, after even a short confinement, into a semifatuous condition, from which it was next to impossible to arouse them, and others became violently insane; others still, committed suicide; while those who stood the ordeal better were not generally reformed, and in most cases did not recover sufficient mental activity to be of any sub-

sequent service to the community” (*In re Medley*, 134 U.S. 160 [1890]; Boston 2000, p. 1).

Therefore, the Supreme Court continued, different isolation systems were tried out, but finally “some 30 or 40 years ago [the 1850s and 1860s] the whole subject attracted the general public attention, and . . . solitary confinement was found to be too severe” (*Medley*, 134 U.S. 160 [1890]). Other U.S. legal decisions around the turn of the century reflected the same awareness of “the painful psychological effects of solitary confinement” (Haney and Lynch 1997, p. 486).

This development toward condemnation of solitary confinement seems to have been somewhat slower within the international community of prison experts. At a penitentiary congress in London in 1872, solitary confinement was subject to a lively discussion that ended without resolutions being drawn up, and in 1900 at a penitentiary congress in Brussels, some claimed that even prolonged isolation had no health effects. At a penitentiary congress in Prague in 1930, however, international resolutions were drawn up that expressed the troubling aspects of solitary confinement. The congress specified that if solitary confinement was used for a short duration, adequate medical service was to be available. The congress furthermore advised that solitary confinement should not be used in connection with sentences of long duration (Teeters 1949, pp. 38, 110, 172). Solitary confinement before a trial was not discussed.

#### *D. Scandinavia, Holland, and Belgium as Special Cases*

From the 1860s onward, the use of solitary confinement declined gradually in the Western world. The Pennsylvania model and the era of large-scale isolation passed sometime in the beginning of the twentieth century. Isolation was, of course, used throughout the nineteenth and twentieth centuries not only in Pennsylvania model institutions, but typically as short-term punishment in most prisons, and on a much lower scale.

In a number of countries, especially Holland, Belgium, Sweden, Norway, and Denmark, the use of large-scale isolation persisted into the twentieth century. In Norway, the Pennsylvania model was still in operation during the late 1920s (Berggrav 1928). In Sweden, 90 percent of all prisoners served their entire sentence in isolation at the beginning of the twentieth century, and solitary confinement of sentenced prisoners was not abandoned until 1946 (Nilsson 1999, p. 443;

2003, p. 9). In Denmark, the Pennsylvania model (including panoptic isolation churches) was used until the early 1930s (Smith 2003, p. 245; 2005). According to one observer, Vridsløselille Penitentiary in Denmark was “one of the last prisons in the world” to give up the characteristics of the Pennsylvania system (Johnston 2000, p. 111). In Belgium, solitary confinement became exceedingly popular in the prison system during the later half of the nineteenth century, and elements of the Pennsylvania system lingered on until after World War II (p. 104). Finally, solitary confinement was used liberally in Holland throughout the first half of the twentieth century (Spierenburg 1996, p. 30).

Possible reasons why the Pennsylvania system persisted in those countries include their relatively small sizes and the fact that they all operated relatively centralized and efficient bureaucracies in the middle of the nineteenth century, which perhaps contributed to a more thorough reformation of their prison systems. In Denmark, for example, the entire prison system, including remand prisons, was reconfigured between 1840 and the 1870s. In larger countries, which experienced more political turmoil or had a more decentralized administration, such as France, Italy, and Germany, the reform process was more blurred, and the philosophy of rehabilitation through isolation passed its heyday before the entire national prison systems were reformed.<sup>13</sup>

The United Kingdom appears to have been a special case. Relatively large-scale use of solitary confinement also survived into the twentieth century, but without the support of the philosophy of rehabilitation. The Pennsylvania system had been modified during the nineteenth century into a progressive system so that only an initial period of the sentence was carried out in isolation. Although the belief in reformation through isolation gradually disappeared and a very harsh and punitive prison practice was adopted from the 1860s onward, this did not put an end to solitary confinement. Isolation was perceived as a contribution to a punitive and deterrent prison system. The first 28 days of a sentence to a local prison were therefore served in isolation from the late nineteenth century until 1921, and a period of solitary confinement remained in use in convict prisons. Still this was a much more modest use of isolation than, for example, in Sweden and Denmark, where several years could be spent in isolation in twentieth-century

<sup>13</sup> Concerning other attempts at explaining local isolation practices, see Franke (1992), Spierenburg (1996), Nilsson (1999), and Forsythe (2004).

prisons.<sup>14</sup> In England the period of solitary confinement in convict prisons was gradually reduced between 1842 and 1921 from eighteen months, to twelve months, to nine months, and during Churchill's days as home secretary in 1910 and 1911 to three months for recidivists and one month for first-time offenders (Ignatieff 1978, p. 3; Johnston 2000, p. 90; Forsythe 2004, p. 761). Between 1921 and 1939 this use of isolation was entirely abandoned in England (Forsythe 2004, p. 768).

Contrary to developments in the United Kingdom, Holland, and Belgium, the nineteenth-century Scandinavian approach continued into modern times. Denmark, Sweden, Norway, and Iceland have all been criticized by the CPT during the 1990s for their use of pretrial solitary confinement. Solitary confinement in remand prisons has therefore been termed a "peculiarly Scandinavian phenomenon,"<sup>15</sup> which stands in marked contrast to the traditional image of Scandinavian leniency in the area of penal policy (Evans and Morgan 1998, p. 247). However, this critical view was expressed as early as 1929, when Denmark received international criticism for its use of solitary confinement. In an international journal under the heading "Prisons of Denmark," E. Roy Calvert noted that the Danes still had not learned "the bitter lesson" that solitary confinement damages the health of prisoners (Teeters 1944, p. 89).

#### *E. Post-World War II: New Research*

Solitary confinement was more or less rediscovered as a subject for psychological and psychiatric studies during the 1950s. This rediscovery took place largely without reference to the history of the modern penitentiary or the evidence from large-scale isolation in nineteenth-century prisons.

The first wave of post-World War II studies involving different kinds of isolation of individuals became known as experiments in sensory deprivation (SD) and perceptual deprivation (PD) and were initiated at McGill University in Montreal during the early 1950s. The McGill studies—and other SD experiments—were inspired by Donald O. Hebb's theory on behavior and motivation as well as stories about Chinese "brainwashing" of POWs during the Korean War by the use of techniques that involved social isolation (Brownfield 1965; Vernon

<sup>14</sup> Up to three years in Sweden by the turn of the century (Nilsson 2003, p. 9) and up to three and one-half years in Denmark (Smith 2003).

<sup>15</sup> See also the official reports from the CPT at <http://www.cpt.coe.int/en/>.

1965; Suedfeld 1969; Andersen 1992). McGill male volunteers were isolated and subjected to homogeneous sound and light settings. The subjects were told to remain incarcerated as long as they could handle it. Afterward the experimenters described how the volunteers had been affected by the experience. These studies inspired a wide range of psychological experiments with sensory deprivation, and a wave of SD and PD studies followed in universities and hospitals in different parts of the world, especially during the 1950s and 1960s. The results were widely discussed by biological and behavioral scientists, in psychological textbooks, in studies about brainwashing and space travel, and by interested laymen (Suedfeld 1969; Zubek 1973). Generally speaking, these experiments were not about recreating a prison experience, they used volunteers, and they did not last very long—typically from less than an hour to a couple of weeks. Still, many of these studies described and dealt with possible effects of solitary confinement.

A wide range of experimental conditions were used that in different ways deprived the subject of his or her normal range of sensory input (Rossi 1969). Volunteers were incarcerated in boxes or small rooms, confined to a bed throughout the experiment, or submerged into water in various ways. It was often reported that subjects fantasized or hallucinated during these experiments (Smith 2003, p. 212). In the McGill studies, virtually all subjects reported hallucinations. Some witnessed geometric forms, bizarre architecture, and various landscapes and scenes. Hearing and physical senses were also affected in several cases. One subject reported hearing people speak, and another suddenly saw a door handle and experienced an electrical shock when he grabbed it. Hearing music was also reported (Vernon 1965, pp. 119–20; Zuckerman 1969*a*, pp. 95–97; Zubek 1973, pp. 13–15).

During an experiment at Princeton University, volunteers were isolated in dark soundproof rooms, and once again hallucinations were reported, although with less frequency and intensity. Both minor hallucinations and relatively complex ones such as seeing a window or a ventilator were reported. One subject saw a coin on the floor, which disappeared as he tried to pick it up. As the SD conditions were made more severe during additional experiments, more (and more complex) hallucinations were reported (Vernon 1965, pp. 124–34).

Other symptoms repeatedly reported in SD and PD research include cognitive effects, such as disturbed thought processes, concentration problems, and impaired memory (Andersen 1992, p. 2666). A drop in

EEG (electroencephalography) frequency has also been recorded in isolated volunteers (Scott and Gendreau 1969; Zuckerman 1969*b*, p. 60; Andersen 1992), as have drowsiness and prolonged periods of sleep (Vernon 1965, pp. 11–14; Andersen 1992).

Positive effects of SD and PD have also been reported (although with much lower frequency than negative symptoms), and it has been discussed whether or not SD might have a therapeutic value in certain contexts—for example, when treating schizophrenia (Gibby, Adams, and Carrera 1977; Grassian and Friedman 1986, p. 60; Andersen 1992).

A limited number of studies have been carried out with volunteers in individual social isolation, but under conditions that did not amount to sensory and perceptual deprivation. According to psychologist Duane P. Schultz, individual social isolation produces more “serious consequences” than small group social isolation, and generally evidence points toward significant “individual differences in tolerance” (Schultz 1965, pp. 164–67).

Generally speaking, SD and PD studies revealed that isolating people and severely restricting sensory stimulation can provoke a number of quite drastic reactions and symptoms—even after short durations of isolation (hours or days)—including, for example, hallucinations, confusion, lethargy, anxiety, panic, time distortions, impaired memory, and psychotic behavior (Zuckerman et al. 1962; Brownfield 1965; Schultz 1965; Vernon 1965; Rasmussen 1973; Zubek 1973; Andersen 1992; Haney and Lynch 1997).

In 1965 Schultz concluded that sensory restriction could result in “gross disturbances of functioning” and affect perception, cognition, and learning (1965, p. 169). In 1973 Zubek concluded that the literature revealed that SD and PD produced “widespread behavioral and physiological impairments” (1973, p. 64). According to Haney and Lynch, SD studies therefore “emphasize the importance of sensory stimulation in human experience and the dramatic effects that can be produced when such stimulation is significantly curtailed” (1997, p. 502).

## II. Modern Research

A few post–World War II studies of solitary confinement in prisons report no or minor health effects, but the vast majority report substantial health effects. Different opinions on the effects of solitary con-

finement exist, and some have referred to research into this area as “complex” (Coid et al. 2003*b*, p. 336). I have found only two studies of solitary confinement in prisons that did not use volunteers and did not conclude that there were substantial negative health effects (Suedfeld et al. 1982; Zinger and Wichmann 1999).

One of these (Zinger and Wichmann 1999) is a longitudinal control group study of sixty inmates of whom twenty-three remained for sixty days in administrative segregation; but it represents quite limited evidence in this context since only ten inmates in the final sample were subjected to involuntary isolation (p. 39). The initial testing of the segregated prisoners took place, on average, 3.6 days after their isolation, whereby the initial probably very difficult period of adjustment and possible deterioration was lost to the study. A very high attrition rate (out of fifty-five originally involuntarily isolated, only ten remained after sixty days) is also an obvious problem. That those in segregation had significant previous segregation experience (on average twelve previous segregation experiences) also is clearly important (Roberts and Gebotys 2001; Jackson 2004). The authors were well aware of some of the study’s limitations and considered their findings “somewhat irrelevant to current segregation practices in the United States where offenders can be segregated for years for disciplinary infractions with virtually no distractions, human contacts, services or programs” (Zinger and Wichmann 1999, p. 64). But perhaps the most significant problem was the *limited* confidentiality that participants were offered. The researchers told the inmates that any information obtained during interviews that in any way related to their own safety or that of the institution would be disclosed (p. 81). As Palys and Lowman have pointed out, the researchers in the Zinger study thereby effectively told the inmates that they wanted to know about the effects of solitary confinement, but if they revealed any, for example, irrational anger or suicidal tendencies, they would probably report them, a report which could clearly influence the prisoner’s possibilities of getting out of segregation (according to Jackson [2004]).

The Suedfeld et al. (1982) study reported numerous adverse health effects (difficulty to adapt, difficulty in concentrating, sleeping disturbances, dizziness, distortion of the sense of time, anger, apathy, impaired memory) in a pilot study but refused to treat these symptoms

reported by prisoners as objective negative health effects of solitary confinement.<sup>16</sup>

The Suedfeld et al. study along with some experimental studies led two Canadian authors, Bonta and Gendreau, to conclude that solitary confinement actually had no adverse health effects (Gendreau and Bonta 1984; Bonta and Gendreau 1990 [reprinted in Flanagan (1995)]).<sup>17</sup>

The configuration and content of a specific study will shape its results, and some studies may—owing to their methodology—not have been able to penetrate the psychology of the imprisoned individuals. Different conditions in prisons, and especially the differences between laboratory research using volunteers and involuntary isolation in real prisons, can explain some variations in results. This would go a long way to explain why some researchers have been unable to find negative effects of solitary confinement in experimental settings.<sup>18</sup>

Many researchers have reported that it can be difficult to learn about symptoms suffered by isolated inmates since many hide their condition (Koch 1982, p. 378; Grassian 1983, p. 1451; Jackson 1983, p. 65; Toch 1992, p. 52). This is perhaps especially true concerning male prisoners (Jensen 1988, p. 16). Inability of prisoners to cope with solitary confinement might be perceived as a weakness by prison guards—a weakness many prisoners will try hard not to reveal (Fellner and Mariner 1997, pp. 62–63). Even if prisoners reveal such weaknesses, they may often be interpreted by prison staff (doctors, guards, etc.) as conscious attempts at manipulating the authorities in order to get special treatment (Grassian 1999, p. 20; Kupers 1999, p. 5; Conover 2001, p. 139). A Human Rights Watch report describes how staff (at Attica Prison) were preoccupied with not being “conned” or manipulated by prisoners (Grassian 1999). Even self-mutilation can be interpreted in that way.

Several observers report that it is often extremely difficult, traumatic,

<sup>16</sup> Concerning the symptoms mentioned, see Suedfeld et al. (1982, pp. 316, 331). The authors were apparently unaware of the historical material reporting negative health effects of solitary confinement (p. 312). See also Haney and Lynch (1997, p. 520).

<sup>17</sup> Gendreau and Bonta display the same historical unawareness that characterized Suedfeld et al. (1982) since they claim that the pioneering study of solitary confinement is from 1963 (Gendreau and Bonta 1984, p. 469).

<sup>18</sup> One of the articles sometimes drawn forward as a study that does not document adverse effects is Walters, Callagan, and Newman (1963). This study deals with an experimental situation, although it takes place in a prison (twenty volunteers were selected for experimental solitary confinement). Furthermore, isolation lasted only four days, and adverse effects were reported: an increase in anxiety among isolated individuals (p. 772).

and painful for formerly isolated individuals to talk about—and thereby relive—their experience of solitary confinement (Koch 1982, p. 379; Jackson 1983, p. 65). A few studies seem to explain the fact that some inmates do not complain and seem to adapt more or less peacefully to solitary confinement as a sign of a healthy coping strategy; others explain this as an unhealthy sign of social withdrawal typically accompanied by severe psychological problems. Such problems often will be discovered only by personal in-depth interviews in a positive (therapeutic) atmosphere (Koch 1982, pp. 376, 379; Toch 1992, chap. 1). An illustrative symptom of apparent adjustment to solitary confinement is the way that long-term isolated prisoners will sometimes try to avoid (the already minimal) contact (Koch 1982, p. 376).

Another phenomenon often encountered in prisons is that prison staff sometimes become accustomed and numb to the behavior of isolated inmates (Koch 1982, p. 379; Jensen 1988, p. 17; Kupers 1999, p. 5). In some institutions—such as supermax prisons—a “callous and cynical” attitude may develop (Toch 2001, p. 383). According to Toch, “supermax work degrades the workers” (p. 383).

Another problem in describing the effects of solitary confinement is that a relatively high percentage of inmates, especially in disciplinary/administrative segregation, special housing units (SHU), and supermax prisons, are mentally ill from the outset (Hodgins and Coté 1991; Fellner and Mariner 1997, p. 70; Bresnihan 2002; Abramsky and Fellner 2003; Coid et al. 2003*b*). These prisoners will typically experience a deterioration of their health in solitary confinement. However, the problem of inmates being mentally ill from the outset is less significant in connection with isolation of remand prisoners. Several studies cited below have a longitudinal element, which makes it possible to address the effect of isolation even on mentally ill prisoners.

Finally, research suggests that people can react very differently to solitary confinement. According to Danish psychiatrist Henrik Steen Andersen, there is “a great individual difference, ranging from no reaction to being in solitary confinement for a year to serious reaction to a short period of solitary confinement, so the individual constitution is important—not surprisingly” (Thelle and Traeholt 2003, p. 769; Grassian 1993, p. 13). Some clearly manage to adapt more successfully than others (Toch 1992, p. 48; concerning coping activities in solitary confinement, see Melvin [n.d.] and Deaton, Berg, and Richlin [1977]), and one study reports a few cases of positive behavioral change in

disruptive inmates through the use of isolation (Suedfeld and Roy 1975). For some actively psychotic prison inmates or psychiatric hospital patients, according to some studies, solitary confinement can be used as a beneficial treatment (Gibby, Adams, and Carrera 1977; Grasian and Friedman 1986, p. 60), although many will be affected negatively. Some experts therefore discourage the use of seclusion in psychiatric hospitals or suggest less use of seclusion (Farrel and Dares 1996).

A few mentally healthy people can apparently also turn the experience of solitary confinement into something positive. Ludovick S. Mwijage, who was incarcerated in several African prisons, claims in his memoirs that once “solitary confinement had sharpened my mind,” although he also reported a negative effect such as insomnia (1996, pp. 86, 95). The vast majority of memoir writers who have experienced solitary confinement—for example, former hostages—have a much more disturbing recollection of their imprisonment and describe many adverse symptoms (concerning hostages, see, e.g., Siegel [1984] and Turnbull [1997]). According to Jack Abbot, for example, who wrote about his many years in American prisons, solitary confinement could “alter the ontological makeup of a stone,” and from his numerous experiences of isolation he described how time descended in his cell “like the lid of a coffin.” The primary goal was to go on “without losing my mind” (Haney and Lynch 1997, p. 511).

Despite the methodological difficulties outlined here, research on effects of solitary confinement has produced a massive body of data documenting serious adverse health effects. Haney and Lynch—whose review covers a broader range of topics (seclusion in hospitals, studies of torture victims) than this one but significantly fewer studies of solitary confinement in actual prisons—stressed that “a very clear and consistent message [documenting the negative health effects of solitary confinement] emerges from the examination of studies conducted over a vast array of isolated and restricted conditions for subjects who differed greatly in background and the duration of their confinement” (1997, p. 499).

A systematic summary and classification (according to the discussion of health effects) of the studies discussed here is provided in the Appendix.

*A. Major Studies and Their Overall Conclusions*

Solitary confinement produces a higher rate of psychiatric and psychological health problems than “normal” imprisonment. This has been shown especially convincingly in studies with randomly selected samples and control groups of nonisolated prisoners.

In a study of 203 male patients in a psychiatric clinic in Zurich, of whom 102 were committed from a prison (every tenth patient in the clinic came from a prison), 76 percent came directly from solitary confinement (although the vast majority of Swiss prisoners of course are not isolated). For 71 percent of the 102 prisoners, it was their first hospitalization for psychiatric reasons. The study was based on medical records, criminal records, and a limited number of interviews. The authors concluded that “Untersuchungs-Einzelhäftlinge [werden] proportional viel häufiger psychiatrisch hospitalisierungsbedürftig als Gemeinschaftshäftlinge des Strafvollzugs” (Remand prisoners in solitary confinement are proportionally much more often in need of psychiatric hospitalization compared with prisoners not in solitary confinement [trans. by the author]) (Volkart, Rothenfluth, et al. 1983, p. 374). Remand prisoners in solitary confinement were, in other words, much more often hospitalized for psychiatric reasons than prisoners who came from communal prison conditions. Those who were hospitalized from solitary confinement had experienced, on average, eighty-six days of imprisonment prior to their hospitalization, as opposed to 173 days experienced by those who came from communal imprisonment (p. 373).

Volkart and colleagues published another study in 1983 comparing thirty prisoners in solitary confinement (twenty remand prisoners and ten in disciplinary segregation) with a control group of twenty-eight prisoners in communal imprisonment. The study was cross-sectional, incorporated no longitudinal data, and was not interview-based. According to Andersen, the participants were tested for “few pre-prison factors” (Andersen 2004, p. 39). Isolated inmates had spent an average of ninety-one days in solitary confinement (minimum thirty days), whereas the control group had spent, on average, 326 days imprisoned. All participants had normal intelligence. Their health and personalities were then assessed through psychiatric questionnaires. The group of isolated inmates “showed considerably more psychopathological symptoms than the control group . . . [and these] effects were mainly caused by solitary confinement; age, schooling, duration of detention

and personality turned out to be of subordinate importance” (Volkart, Dittrich et al. 1983, p. 44).

Two Norwegian studies of remand prisoners have also documented health risks involved in using solitary confinement. A 1993 longitudinal study of sixty-three isolated remand prisoners, which excluded inmates with obvious withdrawal symptoms and those deemed at risk of suffering from a psychosis, found a development of widespread health problems after four weeks of solitary confinement, including depression, anxiety, stomach and muscle pains, and inability to concentrate (Gamman 2001, pp. 44–45). A follow-up in 1995 with a sample of fifty-four remand prisoners included a control group (twenty-seven inmates in each group) and had a longitudinal design. Those in solitary confinement suffered significantly more both physically and psychologically than the prisoners in the control group (sleeplessness, concentration problems, anxiety, depressions, etc.). The isolated prisoners were given and used much more medication than the control group (Gamman 1995, 2001, p. 45). Gamman’s 1995 study has been criticized for not using standardized instruments besides the Montgomery-Åsbergs Depression Rating Scale (Andersen 2004, p. 39). Gamman points out that the control group in his 1995 study was slightly different from his isolation group, and the latter contained more detainees charged with drug offenses and had a five-year higher average age. Most important, though, the isolation group was healthier (both physically and mentally) than the control group (Gamman 1995, p. 2245; 2001, p. 45). The 1995 study also excluded inmates with a known intolerance for solitary confinement. Eleven remand prisoners were thus excluded, of whom six were in solitary confinement. All six developed a psychosis during the imprisonment in isolation, and of the five others only one became in need of psychiatric treatment (Gamman 1995, p. 2245).

A large-scale Danish longitudinal study from 1994—involving 367 pretrial detainees—reported a significantly higher rate of psychiatric problems among isolated than among a control group of nonisolated prisoners. A higher incidence of psychiatric morbidity—mainly adjustment disorders—was found among those in solitary confinement (28 percent) than among those not in isolation (15 percent). The rate of psychiatric morbidity was highest (43 percent) among a third group (which did not overlap with the above-mentioned groups) of remand prisoners who had been in long-term solitary confinement (more than two months) (Andersen et al. 1994, p. 114). A number of standardized

instruments were used to measure health quantitatively. The scores for those in solitary (as a group) were unchanged throughout the isolation period, and those not in isolation “had a gradual improvement on most quantitative mental health scores during this early phase of imprisonment” (Andersen 2004, p. 39). Those in solitary confinement experienced an improvement in health scores when the solitary confinement conditions were relieved (p. 39). The researchers concluded that the differences between the isolated remand prisoners and the control group were caused “mainly by different conditions of SC and non-SC” (p. 39). Finally, it was concluded that pretrial detention in isolation compared with pretrial detention without isolation involved strain and risk of damaging the mental health of the imprisoned individuals (Andersen et al. 1994, vol. 1, pp. 114, 165).

The 1994 study is (methodologically speaking) perhaps the best-designed scientific quantitative study on the effects of solitary confinement so far. Still an important methodological issue should be addressed. The very thoroughness of the study caused the research itself to constitute a very significant intrusion into the lives of the isolated (and nonisolated) prisoners, something that Andersen and colleagues have themselves discussed (Andersen et al. 1994; Andersen 2004, pp. 40–41). Initially remand prisoners included in the sample were interviewed by one of the researchers—typically for three hours; afterward the inmate had to fill out questionnaires, and his or her pulse and blood sample were taken. One to three days later, one or two days of psychological testing and a further interview followed—typically lasting two hours each day (or four hours one day). The psychological testing and interview would then be repeated after three weeks of confinement, after two months, and then after each additional month for those still in pretrial detention. This meant that the imprisoned individuals—including those in so-called isolation—received extensive attention from doctors and psychologists during the study period. During the first approximately three weeks of imprisonment, those in isolation were typically subjected to four or five days of intense interviews and testing of around two (sometimes three or four) hours each day—not counting filling out questionnaires, having blood samples taken, and so forth. In other words, these remand prisoners were effectively *not* in solitary confinement during those four or five days. This constituted around 20–25 percent of the period between the first test and the end of the second test round after approximately three weeks. This leveled

out some of the differences between the solitary confinement and non-solitary conditions and must almost certainly have significantly downgraded the measured differences between the isolated prisoners and the control group. This would be especially true since the interviews constituted meaningful social contact in which the well-being and innermost thoughts of the imprisoned individual were in focus, precisely the kind of contact that isolated prisoners normally lack.

This methodological issue might help explain why the second part of the 1994 study—a survey of hospitalization among remand prisoners—could be interpreted as giving even more clear-cut results. A sample of 124 remand prisoners who had been transferred to a prison hospital revealed that if “a person remained in SC [solitary confinement] for four weeks the likelihood of being admitted to the prison hospital for a psychiatric reason was about twenty times as high as for a person remanded in nSC [non-solitary confinement] for the same period of time” (Sestoft et al. 1998, p. 103). A sample of thirty-seven remand prisoners admitted to a specific prison hospital also revealed that among those who came directly from isolation, 63.7 percent were admitted purely for psychiatric reasons and 18.2 percent purely for somatic reasons. Among those who came from nonisolation, 42.3 percent were admitted for purely psychiatric reasons and 53.8 percent purely for somatic reasons (p. 101).

The authors concluded that “individuals detained in SC are forced into an environment that increases their risk of hospitalization to the prison hospital for psychiatric reasons. These findings reflect the national [Danish] legislation, and hence those responsible must consider methods of achieving an acceptable standard for law and order and public security either without SC or with major modifications” (Sestoft et al. 1998, pp. 105–6).

A 1997 follow-up of the 1994 study was based on reports (questionnaires) from former participants in the original study. Almost half the original participants (excluding those in the survey of hospitalization among remand prisoners) completed questionnaires (between 41 and 49 percent from the three different groups of isolated, nonisolated, and long-term isolated remand prisoners). The dropout rate was caused by individuals leaving the country, dying, disappearing, and not wanting to participate (Andersen, Lillebæk, and Sestoft 1997). Analysis of the dropout rate revealed that three factors could explain it: the higher the subject’s intelligence, the likelier that the participant would answer the

follow-up questionnaires; participants suffering from schizophrenia (or related disorders) were less likely to answer; and the longer the imprisonment, the greater the chance of answering (p. 24).

The 1997 follow-up highlights how some remand prisoners remember their imprisonment. Former remand prisoners having been imprisoned under an isolation regime found their incarceration significantly more straining than remand prisoners who had been imprisoned under “normal” conditions. Thirty-eight percent of those in solitary confinement and 36 percent of those in long-term solitary found their remand imprisonment extraordinarily straining, as opposed to 12 percent of those not in solitary (Andersen, Lillebæk, and Sestoft 1997, p. 31). More formerly isolated remand prisoners also reported having suffered strong psychological reactions while being imprisoned than those who were not isolated: 23 percent of those in solitary confinement and 27 percent of those in long-term solitary reported that they experienced severe psychological reactions after their remand imprisonment, as opposed to 9 percent of those not in solitary (p. 38). The basic conclusion from the 1994 study was supported but also strengthened since the authors recommended that both “medically and psychologically” solitary confinement should not be used during pretrial confinement (p. 59).

In the early 1990s, psychologist Craig Haney assessed the psychological health of 100 inmates in California’s Pelican Bay SHU and has produced the most thorough research on the effects of the supermax variant of solitary confinement. Haney’s original study was conducted as part of the *Madrid vs. Gomez* case. The sample of 100 inmates was randomly selected, and inmates were then individually assessed in two different face-to-face interviews. The data were considered representative of the entire group of prisoners at this specific supermax facility (Haney 2003, pp. 132–33). Considerable and severe effects of solitary confinement were found with very high prevalence rates. For example, 91 percent suffered from anxiety and nervousness, and 70 percent “felt themselves on the verge of an emotional breakdown” (p. 133). Seventy-seven percent were in a state of chronic depression, and two-thirds suffered from many different symptoms (pp. 133–34).

Some obvious methodological problems worth noting are that there was no control group, and no longitudinal data were available. Nevertheless the extremely high prevalence rates clearly exceed base expectancy rates for mental health problems even among prisoners gen-

erally found in disciplinary or administrative segregation. Compared with the studies of Swiss, Danish, and Norwegian solitary confinement conditions, the Californian supermax conditions would probably be considered more inhumane by most observers. According to Haney, the Pelican Bay SHU is “the most lifeless environment in . . . [California’s]—or any—correctional system” (Haney 1993, p. 3).

Stuart Grassian’s 1983 study of a group of inmates in solitary confinement includes only fifteen inmates but is one of the most cited on the effects of solitary confinement (possibly together with Suedfeld et al. [1982]). Like Haney’s, it was carried out in connection with a court case; fifteen inmates from a prison in Massachusetts were plaintiffs (and fourteen were interviewed and studied). Grassian described numerous and severe symptoms suffered by the inmates and asserted that these symptoms formed “a major, clinically distinguishable psychiatric syndrome” (1983, p. 1459). The study is methodologically problematic because of the small sample size, the lack of a control group, and the obvious selection bias. Grassian produced a qualitative analysis, however, that was consistent with nineteenth-century German literature and clearly caught the attention of others interested in the field.

While both Haney’s and Grassian’s studies were carried out as parts of ongoing court cases, that was not the case with the Swiss, Danish, and Norwegian studies. The Danish 1994 and 1997 studies, though, were requested by the Danish Ministry of Justice, which was represented in a reference group, under whose auspices the study was carried out (the researchers themselves were independent). The Danish study setup could therefore potentially create bias in favor of the state and its existing practice. But being affiliated with plaintiffs in court cases could also possibly bias researchers against or in favor of in-state practices of solitary confinement.

### *B. Other Studies and Literature Reviews*

Other studies on the effects of solitary confinement on prisoners are briefly described below, together with conclusions from some of the most important literature reviews.

Clare et al. (2001) evaluated the English Close Supervision Centers (CSC) in 2001, dealing with many issues related to the practice of segregating prisoners. Psychiatric assessments of prisoners in CSCs were made and interviews were conducted with twenty-three inmates. A high rate of mental illness was found. A study of the effects of solitary

confinement was not made, however, but interviews with four prisoners who had been isolated for twenty-three hours a day reported briefly on possible effects of solitary confinement. Severe symptoms, including hallucinations, were reported, but these could have been caused by prior illnesses such as schizophrenia.

The Human Rights Watch report *Cold Storage* is based on studies of inmates in two supermax facilities in Indiana in 1995, 1996, and 1997. In both facilities, the research team had short conversations with around forty inmates and extended interviews in private rooms with approximately ten inmates in 1995 and 1996. In 1997, two psychiatrists conducted structured interviews with and assessed the health of forty-one inmates while using a rating scale “widely accepted in the psychiatric field” (Fellner and Mariner 1997, p. 4). The psychiatrists identified many prisoners “who were suffering from serious mental disorders.” It appeared that most “had previous histories of mental disorder,” so the researchers could not conclude that isolation had caused mental illness; but they concluded that “their condition was exacerbated by confinement at the MCF and SHU” and thereby proposed a causal link between segregation in solitary confinement and adverse health effects (p. 70).

In 1988, psychologists Stanley Brodsky and Forrest Scogin presented three studies of the effects of protective custody in three different U.S. prisons. In all three studies, Brodsky had acted as an outside expert brought in by attorneys for inmate plaintiffs or the state in a class action law suit against prison/protective custody conditions. In the first study, several prisoners were in solitary confinement (twenty-three hours in cell time), but some were double-celled. No control group was established, but the sample was apparently randomly selected. A standardized procedure using the Omnibus Stress questionnaire and an isolation effects checklist was used. In the second study, an Isolation Sentence-Completion Test was devised and used. Forty-five prisoners were interviewed in the first two studies, and a very high prevalence of psychological (and physical) symptoms was found including nervousness (84 percent), hallucinations and delusions (42 percent), and suicidal thoughts/depression (77 percent) in the first study and physical symptoms (79 percent), anxiety (45 percent), and depression (36 percent) in the second. The authors were not able to assert the cause of these symptoms, since many of those in protective custody could have had preexisting pathologies. But a third study in another prison showed

that inmates in protective custody, with spacious two-man cells and access to program activities, had no complaints. The authors concluded that protective custody was not necessarily harmful, but it had “strong potential for harmful effects” (Brodsky and Scogin 1988, p. 279) and pointed to social isolation as a possible cause. While conditions never amounted to sensory deprivation, protective custody could “deprive the inmates of the opportunity to engage in the behaviors that allow us to define who we are” (p. 279). The authors therefore recommended that “sufficient stimulation and activities” were provided “to ensure the psychological well-being of the prisoners” (p. 280). Brodsky and Scogin’s material is importantly different from the other studies cited here since a significant proportion of their inmates had chosen protective custody themselves, and not all of those in such custody were in solitary confinement. A qualitative Norwegian study also deals with the effects of isolation among inmates who have chosen isolation themselves (Hammerlin and Larsen 2000).

In 1987 Foster and colleagues published a study of South African detention practices, which included an empirical study of remand prisoners and dealt with the effects of solitary confinement. The study sample consisted of 175 cases of detention involving 158 individuals, and 79 percent of the detentions involved solitary confinement. Most also involved beatings or other forms of abuse. Information was gathered through semistructured interviews. Remand prisoners described the experience of solitary confinement in very negative terms, including such effects as anxiety, talking to oneself, and fears of going insane. The authors conclude that “there can be little doubt that solitary confinement under these circumstances [in South Africa] should in itself be regarded as a form of torture” (Foster, Davis, and Sandler 1987, p. 136).

Hinkle and Wolf’s 1956 report on “Communist Interrogation and Indoctrination of ‘Enemies of the States’” is a special study seen in the present context, primarily because it rests on information “obtained from a number of sources . . . from experts in the area, who for security reasons must remain anonymous” (1956, p. 116). In other words, it is a product of the Cold War—written in the days when “brain-washing” became a commonly known term—and should of course be seen in that light. Knowledge of “prisoners’ reactions to their experiences,” according to the authors, was thus “obtained by the direct observation of persons recently released from Communist prisons. Some

of these observations continued for weeks and were supplemented by follow-up observations over periods of months” (p. 116). The subject was not solely solitary confinement; nevertheless, it was concluded that an isolation regimen could produce anxiety, depression, illusory experiences, visual hallucinations, and in some cases psychosis. Insanity was normally avoided by breaking the routine of total isolation, and the “lesser” effects were “usually sufficient to make the prisoner eager to talk to his interrogator and to seek some method to escape from a situation which had become intolerable” (p. 129).

Jackson’s (1983) *Prisoners of Isolation*, about the use of solitary confinement in Canada, was based primarily on his work on a court case concerning a group of prisoners isolated in British Columbia Penitentiary. Seven plaintiffs were interviewed. They described severe effects of their imprisonment in solitary confinement. Their claims were assessed by several experts. The case was won, and conditions in the special correctional unit at British Columbia Penitentiary were described as cruel and unusual punishment.

A number of Danish studies concerned with the effects of solitary confinement were published during the early 1980s. They were made by the so-called isolation group, which campaigned for reduction or abolishment in the practice of solitary confinement during pretrial isolation. Much of their material was based on case studies of forty-six remand prisoners in solitary confinement. The studies were strictly qualitative (there were no control groups or standardized instruments, and typically relatively brief analyses of the symptoms registered were offered by psychiatrists and psychologists [Jensen et al. 1980a; Jørgensen 1981]). Finn Jørgensen claimed to identify both an acute and a chronic isolation syndrome (Jørgensen 1990). The most detailed analysis was delivered by psychologist Ida Koch, who concluded that nearly “all prisoners isolated [to avoid collusion] suffer after days or a few weeks of nervous symptoms like concentration and memory difficulties, lack of ability to sleep, psychosomatic symptoms etc. After a few weeks many isolated prisoners suffer from depersonalization, lack of emotional control, anxiety, hallucination and paranoia. Those severe symptoms continue often after isolation when the prisoners again can relate to others. Many feel very handicapped in social contexts and ‘choose’ to continue their lives alone” (1982, p. 382; see also Koch 1983).

In 1975, Benjamin and Lux wrote about the effects of solitary con-

finement as experienced by prisoners in the segregation unit at Maine State Prison. The authors concluded that the use of “forced isolation” at Maine State Prison caused “a severe deterioration of psychological functioning” (1975, p. 89). Interviews with two prisoners were quoted at length, but the number of inmates studied is unclear.

Psychologist Richard Korn has written two reports on the effects of confinement in a high-security unit for administrative segregation at Lexington, Kentucky. The reports are based on two visits to the unit in July and November 1987 by Korn and attorneys from the National Prison Project. The staff was interviewed, and on both occasions the same five women inmates were also interviewed and their psychological situation was assessed. Korn reported serious psychological and psychosomatic effects including severe depressions, hallucinations, anxiety, apathy, loss of weight, and dizziness, which he described as effects of their confinement (Korn 1988*a*, 1988*b*). Confinement conditions, apart from creating “extreme isolation” (1988*a*, p. 10), were also exacerbated by staff hostility (1988*b*, p. 28).

Criminologist Joane Martel produced a qualitative in-depth study based on interviews with twelve women who had experienced segregation in Canadian prisons. No standardized measures or a control group were used. The study covers the conditions of segregation, the prisoners’ experiences of segregation, and their life after segregation. Segregation conditions generally meant twenty-two hours in cell time (Martel 1999, p. 41). The segregation experiences of ten of the studied women “suggest that segregation produces substantial and sometimes lasting, debilitating outcomes for them” (p. 101). Martel also described how “fears of ‘going crazy’ or of ‘losing their minds’ appear to be recurrent in conditions of segregation” (p. 103). She concluded that “the effects of these conditions are damaging and reach far beyond the original intent of segregation policies” (p. 104).

Lorna Rhodes (2004) has recently conducted an anthropological study of a supermax prison in Washington State. The primary aim was not to assess the possible effects of solitary confinement, but the subject was unavoidable. The relevant material consisted primarily of the medical records of 122 inmates and interviews with eighty-seven inmates. Rhodes describes effects of solitary confinement, including hallucinations, anger, and uncontrolled thought processes and illustrates how prison mental health workers are charged with easing symptoms of “paranoia, depression, and delusion.” According to Rhodes, these staff

members are in a sense charged to protect prisoners “from the prison itself” (2004, p. 110).

A Norwegian psychiatric study of punitive and administrative segregation in Oslo Prison was conducted in 2000 and 2001. Thirty inmates in segregation were studied and compared with a control group of thirty inmates who had been referred to psychiatric treatment and had not been in segregation. The method was psychiatric interviews and a protocol that three investigators (two psychiatrists and one psychologist) agree on the diagnosis; no standardized instruments were used. The study did not assess the effects of solitary confinement as such but reported extensive and severe mental problems during imprisonment in segregation, including depressions and hallucinations (Stang et al. 2003).

Psychologist Hans Toch's *Mosaic of Despair: Human Breakdown in Prisons* (1992) is based on hundreds of in-depth interviews with inmates in New York state prisons, with an unknown number of them being in segregation. Toch identifies damaging effects connected especially with solitary confinement (versus other forms of imprisonment). He uses the term “isolation panic” and describes a range of symptoms including panic, rage, loss of control, and complete breakdown. According to Toch, “isolation removes even the coping resources ordinarily available in prisons” and can “dramatize the pains of imprisonment per se.” Isolation panic can therefore mark “a dichotomy in the minds of inmates—a distinction between imprisonment, which is tolerable, and isolation, which is not” (1992, pp. 48–54).

I undertook a study of the effects of solitary confinement in a Danish nineteenth-century penitentiary based on archival material. This included medical reports, journals, and prisoner journals from the prison archive, as well as official statistics and publications from the Danish Prison Service and other experts. Most of the data were longitudinal, and the study had both qualitative and quantitative aspects. Conclusions were based on a sample of 300 inmates, and in some cases on statistics covering more than 3,000 inmates. A third (33 percent) of the inmates suffered from symptoms caused mainly by isolation. In comparisons of data with modern research, a significant number of methodological issues, of course, arise. The study, for example, lacks a control group, and the definition of mental illness was different in the nineteenth century. It nevertheless clearly shows that the prison administration itself came to perceive the use of solitary confinement as

a huge health problem (they condemned the practice). Symptoms such as lethargy, anxiety, and hallucinations were treated by allowing extra out-of-cell time and limited social contact for certain inmates (Smith 2003, 2004*a*).

All the studies just mentioned report significant adverse effects experienced during solitary confinement, and some go a long way toward identifying these as a product of isolation. Most earlier reviews dealing broadly with the literature on solitary confinement have also concluded that isolation of prisoners can be a very harmful practice (Bonta and Gendreau's [1990] study is the most obvious exception). In 1986, for example, psychiatrist Stuart Grassian and psychologist Nancy Friedman concluded that "late nineteenth and early twentieth-century German clinicians . . . contributed altogether thousands of descriptions of psychosis associated with solitary confinement" while the "more recent literature on this subject has also nearly uniformly described or speculated that solitary confinement has serious psychopathological consequences" (Grassian and Friedman 1986, p. 53).

Three years earlier in another review of the literature concerning the effects of solitary confinement, Reto Volkart concluded that "über den Verlauf der Auswirkungen sind sich die Autoren weitgehend einig, dass massive Einzelhafteffekte sehr rasch (in den ersten Tagen und Stunden) auftreten können. Aber auch sehr langer Einzelhaft wurden besondere Wirkungen zugeschrieben" (Researchers widely agree that massive effects of solitary confinement can set in very quickly—during the initial days or hours. But particular effects are also attributed to very long periods of solitary confinement. [trans. by the author]) (Volkart 1983, pp. 18–19).

In 2003 psychologist Craig Haney concluded that "empirical research on solitary and supermax-like confinement has consistently and unequivocally documented the harmful consequences of living in these kinds of environments" (2003, p. 130).

In 2004 psychiatrist Henrik Steen Andersen concluded in a review that solitary confinement of remand prisoners "imposes additional strain and increases the risk of development of psychiatric morbidity," and furthermore noted that when "differences between SC [solitary confinement] and non-SC have been found in studies of sentenced prisoners the trend disfavours SC." Finally Andersen concluded that sensory deprivation "may contribute to the pathogenesis of incident disorders in SC" (2004, p. 40).

### III. A Wide Range of Symptoms

A wide range of symptoms are described in the solitary confinement literature. When isolated prisoners are asked, they point to anger, hatred, bitterness, boredom, stress, loss of the sense of reality, suicidal thoughts, trouble sleeping, impaired concentration, confusion, depression, and hallucinations (Jensen, Jørgensen, and Rasmussen 1980*a*; Koch 1982; Jackson 1983, p. 64; Korn 1988*b*, p. 25; Andersen, Lillebæk, and Sestoft 1997; Kupers 1999; Martel 1999; Clare et al. 2001, p. 62; Shalev and Guinea 2003; Rhodes 2004). These symptoms vary in degree as well as their health consequences. Still, there is general agreement among many of those who have studied solitary confinement that this mode of imprisonment can produce severe effects (see, e.g., Gray 1847; Hinkle and Wolff 1956, p. 129; Koch 1982, p. 377; Grassian 1983, p. 1453; Haney and Lynch 1997, p. 531; Gamman 2001, p. 48; Smith 2004*a*, p. 8).

One reason symptoms vary is the different conditions under which solitary confinement is carried out. There are huge differences among isolation in nineteenth-century penitentiaries, in U.S. supermax prisons, and in Scandinavian remand prisons. One important lesson nevertheless is that a significant percentage of prisoners subjected to solitary confinement suffer from a similar range of symptoms irrespective of differences in the physical conditions in various prisons and in the treatment of isolated inmates. Solitary confinement has been found to induce everything from different levels of psychological problems to insanity (see also Haney and Lynch 1997, p. 499). The lack of meaningful social contact seems to be a key factor, and access to television, the standard of cell hygiene, and so forth do not constitute social contact, however much these and other prison features may matter for the general health situation and the performance of the prison in question (Liebling 2004).

I have arranged the symptoms of solitary confinement in five categories.<sup>19</sup> These categories necessarily overlap.

#### *A. Physiological Symptoms and Reactions*

Severe headaches are a common complaint (Jackson 1983, p. 67; Koch 1982, p. 377; Andersen, Lillebæk, and Sestoft 1997, p. 39; Gam-

<sup>19</sup> There exists a variety of categorizations of isolation symptoms, and the one used here is inspired by different studies (see, e.g., Koch 1982; Grassian 1983; Gamman 2001; Haney 2003; Smith 2004*a*).

man 2001, p. 48; Haney 2003, p. 133; Stang et al. 2003, p. 1846; Smith 2004a, p. 12). In one study, 88 percent of the isolated inmates suffered from headaches (Haney 2003, p. 133); in another, 53 percent of long-term isolated remand prisoners (more than two months) complained of headaches (Andersen, Lillebæk, and Sestoft 1997, p. 39). In a Norwegian study, 40 percent of the isolated prisoners suffered from continuous headaches (Stang et al. 2003, p. 1846).

Heart palpitations and increased pulse are also common among isolated inmates (Korn 1988a, p. 16; 1988b, p. 25; Andersen et al. 1994, p. 103; Gamman 2001, p. 48; Haney 2003, p. 133; Smith 2003, p. 223).

Oversensitivity to stimuli is also reported (Grassian 1983, p. 1452; Haney 2003, p. 134).<sup>20</sup> This can apparently result in inability to tolerate otherwise normal stimuli. Some isolated prisoners cannot stand ordinary noises and produce dramatic overreactions (see Grassian 1993, p. 4). This was eerily described in 1851 by Hans Christian Andersen during his visit to a Swedish isolation prison: "In the door to each cell, a glass is fixed, as large as an eye, covered on the outside, and from here, the guard, unobserved by the prisoner, sees everything that occurs; but softly, soundlessly, he must come, for the prisoner's hearing in this solitude is oddly sharpened. I removed the covering very gently and put up my eye to look into the closed room. His glance immediately met mine" (1851, pp. 29–33).

Another physiological reaction reported is pains in the abdomen and muscle pains in the neck and back (Gamman 2001, p. 48; Stang et al. 2003, p. 1846). Pains and pressure in the chest have also been reported (Smith 2004a, p. 12).<sup>21</sup>

Problems with digestion (Gamman 2001, p. 48; Smith 2004a, p. 12) and diarrhea have also been reported (Koch 1982, p. 377). A related symptom is weight loss, which is reported in a number of studies (Koch 1982, p. 377; Korn 1988b, p. 25; Clare et al. 2001, p. 62; Smith 2004a, p. 12). In a nineteenth-century solitary confinement prison, 651 out of 1,596 prisoners, or 41 percent, lost weight during the first three months of their stay (in the 1860s), although the prison doctor was

<sup>20</sup> An experimental study in a Canadian maximum-security prison reported a decline in prisoners' EEG frequency as a result of solitary confinement, which according to the authors possibly represented "an increased readiness to respond to external stimulation as solitary confinement progresses" (Gendreau et al. 1972, p. 58). See also Scott and Gendreau (1969, p. 339).

<sup>21</sup> See also official nineteenth-century reports from the Danish Prison Service; *brystsmærter* ("chest pains") and similar terms were sometimes used to describe diseases suffered by inmates in solitary confinement.

free to change the diet of each inmate. In another sample from the same prison, the typical weight loss was shown to be between five and ten kilograms (Smith 2004a, p. 12 [sample size: 300 inmates]). In a sample of five prisoners from a high-security unit in the United States, weight loss likewise varied from five to ten kilograms (Korn 1988a, p. 16).

Haney (2003, p. 133) has reported loss of appetite, perspiring hands, dizziness, and fainting among a significant number of isolated inmates. Dizziness and loss of appetite have also been noted as a symptom of isolation by others (Korn 1988a, p. 16; 1988b, p. 25). The term dizziness was also used in official reports from the Danish Prison Service in descriptions of illnesses suffered in the isolation prison Vridsløselille.

### *B. Confusion and Impaired Concentration*

Isolated inmates often observe that they frequently experience severe problems with their ability to concentrate (Koch 1982, p. 375; Grassian 1983, p. 1453; Jackson 1983, p. 66; Korn 1988b, p. 25; Lærum 1990; Andersen, Lillebæk, and Sestoft 1997, p. 40; Gamman 2001, p. 48).<sup>22</sup> As a result, isolated prisoners are sometimes apparently unable to read and cannot even watch television, although that may be one of the very few ways to pass the time (see, e.g., Koch 1982, p. 376). Prisoners who experience these problems apparently become unable to focus and concentrate enough on specific issues or activities in order to comprehend what is going on.

A state of confusion is a related and an often-reported symptom (Grassian 1983, p. 1452; Gamman 2001, p. 48; Smith 2004a, p. 13). A number of observers use the term “confused thought process” (Haney 2003, p. 134), and others write of “disturbances of thought content” in the form of paranoia and violent fantasies (see below) (Grassian 1983, p. 1453). Korn (1988b, p. 25) describes how isolated prisoners have “difficulty in communicating with individuals from outside” and notes a “decreasing ability by prisoners to direct the flow of their own ideation.”

Loss of memory is another reported experience (Koch 1982, p. 375; Grassian 1983, p. 1452; Gamman 2001, p. 48).

<sup>22</sup> In Andersen et al. (1994), prisoners also reported problems with concentration, but these did not show up in cognitive tests.

*C. Hallucinations, Illusions, and Paranoid Ideas*

Andersen and colleagues reported some—but few—hallucinatory symptoms and changes in perception among isolated Danish remand prisoners (Andersen et al. 1994, p. 116). In Haney's SHU sample, 41 percent experienced hallucinations and 44 percent perceptual distortions (Haney 2003, p. 134). Grassian also reported hallucinations and illusions in his 1983 study, including wavering cell walls, movements, and even the experience of entire visits in the cell (Grassian 1983, p. 1452). The same disturbing effects were reported by isolated prisoners elsewhere in the United States and in Canada (Jackson 1983, p. 66; Korn 1988*a*, p. 16; 1988*b*, p. 26). In a Norwegian study, 20 percent of those in solitary confinement experienced perceptual distortions (Stang et al. 2003, p. 1846). Hallucinations have also been reported by isolated prisoners in Northern Ireland and the former Soviet Union (Hinkle and Wolff 1956, p. 128; Shallice 1972, p. 390), as well as by isolated hostages (see, e.g., Siegel 1984).

Hallucinations and illusions can be connected with paranoia, which in itself is an often-reported symptom of solitary confinement (Koch 1982, p. 377; Grassian 1983, p. 1453; Smith 2004*a*, p. 13). Stang et al. (2003, p. 1846) describe strong feelings of suspicion as a symptom. Cases of paranoia can in isolation apparently deteriorate into "overt psychosis" (Grassian 1993, p. 5). An English case study reports how a twenty-seven-year-old man developed monosymptomatic hypochondriacal psychosis—psychoses with hypochondriacal delusions—in prison segregation (consisting of twenty-three hours or more a day for more than a year). According to the authors, solitary confinement "played a significant part in the development of the illness" (Humphreys and Burnett 1994, p. 345).

Another form of perceptual distortion reported by isolated prisoners is the experience of hearing voices (Grassian 1983, p. 1452; Lærum 1990). Many isolated prisoners also begin talking to themselves (63 percent according to Haney [2003, p. 134]; see also Foster, Davis, and Sandler [1987, p. 139] and Lærum [1990]).

Finally, studies report that isolated individuals fantasize to a great extent (Koch 1982, p. 375). Often these fantasies become violent and aggressive (Grassian 1983, p. 1453; Haney 2003, p. 134).

*D. Emotional Reactions and Impulsive Actions*

Depression and anxiety show up in most studies (Hinkle and Wolff 1956, p. 128; Jørgensen 1981, p. 3346; Grassian 1983, p. 1452; Foster, Davis, and Sandler 1987, p. 137; Korn 1988*b*, p. 25; Andersen et al. 1994; Clare et al. 2001, p. 62; Gamman 2001, p. 48; Haney 2003, p. 133; Stang et al. 2003, p. 1846). Andersen and colleagues reported some cases of depression and anxiety and a significant rate of “adjustment disorder” among isolated prisoners (Andersen et al. 1994, p. 115). Grassian reported “massive free-floating anxiety” among 71 percent of the inmates in his sample, and 91 percent of the prisoners suffered from anxiety in Haney’s study (Grassian 1983, p. 1452; Haney 2003, p. 133). Toch focuses on panic and despair in his description of isolated prisoners in punitive segregation and concludes that “irrespective of dominant concerns, the reaction to isolation is a panic state” (Toch 1992, p. 52).

Problems with impulse control, violent reactions, and self-mutilation are reported with alarming frequency (Koch 1982, p. 376; Grassian 1983, p. 1453; Korn 1988*b*, p. 26; Martel 1999, p. 58; Gamman 2001, p. 48). Toch (1992, p. 52) gives an example of a prisoner banging his body into the walls. Actions of self-mutilation can take the form of suicide attempts, which are treated below.

*E. Lethargy and Debilitation*

Lethargy and chronic tiredness are common symptoms of solitary confinement, which are often described by prisoners as a feeling of how everything comes to a complete standstill (Grassian 1983, p. 1453; Jackson 1983, p. 67; Martel 1999, pp. 57, 73; Haney 2003, p. 133; Smith 2004*a*). In an experimental study of sensory deprivation using volunteers in a Canadian maximum-security prison, a slowing of EEG, alpha frequency, was recorded among socially isolated inmates, which “correlated with apathetic, lethargic behavior” (Scott and Gendreau 1969, p. 340; see also Gendreau et al. 1972, p. 57).

This lethargic condition has been described by researchers in connection with a complete breakdown or disintegration of the identity of the isolated individual. This can be described as a simultaneous attack of several symptoms that effectively erase the personality of the isolated individual: they experience problems talking and understanding others, hallucinate (hear and see things), have constant headaches, are troubled by anxiety, lose control (cry, become lethargic, have fits of rage, etc.),

and reach a condition that resembles (or is) psychosis (Jørgensen 1981, p. 3347; Koch 1982, p. 377). Grassian uses the term “a clinically distinguishable syndrome” when describing the suffering of these multiple isolation symptoms (Grassian 1983, p. 1453). In the words of a South African remand prisoner, “I think your whole personality is transformed” (Foster, Davis, and Sandler 1987, p. 140).

Haney uses the term “impending nervous breakdown” (which 70 percent of his sample suffered) and “overall deterioration” (which 67 percent suffered) (Haney 2003, p. 133).

Another frequent symptom is trouble sleeping (Korn 1988*b*, p. 25; Lærum 1990; Andersen, Lillebæk, and Sestoft 1997, p. 40; Gamman 2001, p. 48; Haney 2003, p. 133), which often comes with loss of the sense of time, and chronic tiredness and lethargy.

Finally, the question of suicidal tendencies. The literature suggests that “physical and social isolation appears strongly related to suicide” (Coid et al. 2003*b*, p. 321). This is supported by reported thoughts of suicide among isolated inmates and self-mutilations (Jørgensen 1981, p. 3347; Gamman 2001, p. 48; Haney 2003, p. 134). Rates and frequencies of suicides during pretrial isolation are discussed below.

#### *F. How Many Are Affected by Solitary Confinement?*

A multitude of pathological reactions are possible, and they can vary greatly. Some suffer from all or most of the symptoms described, some suffer from one or two, and others exhibit no visible ill effects. The prevalence of symptoms also depends on specific prison conditions. It is therefore difficult to give a precise evaluation of the rate of adverse symptoms due to solitary confinement in general.

In supermax prisons in the United States, many adverse symptoms are reported with dramatic prevalence rates. Among “Pelican Bay” SHU prisoners, the following symptoms were in each case suffered by between 83 and 91 percent of the inmates: anxiety, headaches, lethargy, irrational anger, confused thought processes, and social withdrawal. Hallucinations and perceptual distortions were each suffered by more than 40 percent of the studied inmates (Haney 2003, p. 133). Many other authors also report alarming rates of psychological problems and mental disease in supermax prisons (see, e.g., Fellner and Mariner 1997; Kupers 1999). It has to be remembered, of course, that many supermax and SHU prisoners may be mentally ill on arrival. This group of mentally ill prisoners will presumably—like the healthy

ones—generally experience a significant deterioration of their condition during their time in solitary confinement (Fellner and Mariner 1997, p. 70; Kupers 1999; Abramsky and Fellner 2003, p. 149).

Psychiatrist Terry Kupers has visited numerous control units and segregation units in the United States and concludes that “in all the super-maximum security units I have toured, between one-third and half of the prisoners suffer from a serious mental disorder” (1999, p. xviii). Generally speaking, the supermax prisons have been termed as producing “extreme states of mind” (Rhodes 2004, p. 29).

At least 33 percent (and most likely many more) suffered adverse symptoms in a nineteenth-century Danish prison constructed on the Pennsylvania model (samples taken during the period 1859–73). All these prisoners were categorized as both physically and mentally healthy when they arrived in the prison (Smith 2004*a*).

In a study of Norwegian remand prisoners in solitary confinement, 94 percent suffered from adverse symptoms after four weeks; many suffered from serious symptoms such as depression and anxiety (more than half), and 13 percent had mutilated themselves (Gamman 2001, p. 44). In another Norwegian study, more than 43 percent of the isolated prisoners suffered adverse symptoms (Stang et al. 2003, p. 1846).<sup>23</sup>

Some studies do not provide specific percentages of the overall number of inmates who are affected negatively by solitary confinement. Many conclude that solitary confinement constitutes a significant health risk compared to imprisonment without isolation (see, e.g., Andersen et al. 1994; Andersen, Lillebæk, and Sestoft 1997; Sestoft et al. 1998).

#### *G. The Duration of Solitary Confinement and the Associated Health Effects*

Several studies show that serious symptoms can occur in healthy individuals after only a few days in isolation. A Swiss study reported that 36 percent of those sent directly from solitary confinement to a psychiatric clinic were hospitalized during the first one to five days of their confinement in isolation (Volkart, Rothenfluth, et al. 1983). A Danish study of remand prisoners described how symptoms could materialize after a few days but typically did so after two weeks. So-called

<sup>23</sup> Stang et al. report only the prevalence of specific symptoms and do not tell us how many suffered from one symptom or the other. Therefore, more than 43 percent must have suffered from some kind of symptom, and most likely many more.

chronic symptoms were reported after one or two months (Jørgensen 1981). A Danish prison chaplain who had in-depth conversations with many isolated remand prisoners reported serious symptoms after three to six weeks (Manzano 1980, p. 18).

A Norwegian study of remand prisoners found serious and widespread health effects (including anxiety, depression, and self-mutilations) after four weeks of isolation. The author furthermore concluded that the amount of time spent in isolation increased the damaging effects (Gamman 2001, p. 45).

Andersen and colleagues originally reported no specific connection between the duration of solitary confinement and the health of the isolated prisoners (Andersen et al. 1994, p. 165). But since solitary confinement constituted a significant health risk compared to “normal” imprisonment, each day in isolation was likely to constitute a risk that is heightened the longer the isolation continues. This was later confirmed by Sestoft and colleagues in a study of hospitalization of prisoners: “the relative risk of hospitalization in the prison hospital [owing to a psychiatric reason] increased markedly across time spent in SC [solitary confinement]” (Sestoft et al. 1998, p. 105). Still Andersen concluded in an interview that “the reactions [to solitary confinement] often set in very quickly” (Thelle and Traeholt 2003, p. 769).

The overall conclusion must therefore be that, though reactions vary between individuals, negative (sometimes severe) health effects can occur after only a few days of solitary confinement. The health risk rises for each additional day in solitary confinement.

#### *H. Will Symptoms Recede after the Termination of Solitary Confinement?*

A number of studies note that people quickly recover when solitary confinement is terminated (Grassian 1983, p. 1453; Andersen et al. 1994, p. 164; 2003, p. 175; Kupers 1999, p. 62). These tendencies toward “psychological regeneration” could indicate that the health effects of solitary confinement are not chronic. But other studies report serious postisolation effects (e.g., Martel 1999) and a chronic isolation syndrome (Koch 1982; Jørgensen 1990).

The Danish longitudinal follow-up study from 1997 did not report any chronic pathologies or isolation syndromes (Andersen, Lillebæk, and Sestoft 1997, pp. 56, 59), but the data suggested that prisoners who had been in solitary confinement experienced less “psychological compensation” after their release than prisoners who had not been

isolated. The pains of imprisonment were in that sense more intensive among the isolated prisoners during their isolation and afterward (pp. 55, 59).

That is supported by descriptions of how prisoners experience serious trouble returning to society (or imprisonment under “normal” conditions) after having adapted to solitary confinement (Rhodes 2004, p. 34). (Concerning medical and social retrieval of hostages who have experienced solitary confinement, see Turnbull [1997].) This type of reaction has also been found in Denmark (Koch 1982, p. 378). Some apparently experience great anxiety when confronted by social situations after being released from solitary confinement, and some voluntarily continue to prolong their isolation. Many have trouble engaging in social behavior and fear emotional contact. According to Haney, supermax “confinement creates its own set of psychological pressures that, in some instances, uniquely disable prisoners for freeworld reintegration” (2001, p. 11). Martel reports “agoraphobia or panic disorder” in formerly segregated women. Half the sample in Martel’s study experienced “difficulties being in crowded or noisy rooms,” and some felt “utter hate of being around people” (1999, pp. 85–86). Many women therefore “chose to seclude themselves” from the rest of the prison population after being released from segregation (p. 86). Canadian, Danish, and American research thus shows severe signs of social disablement after having experienced solitary confinement (Koch 1982, p. 378; Martel 1999, p. 83; Rhodes 2004, p. 34).

On postsegregation effects in general, Martel concludes that “invalidating stigmas, relived abuse, uncontrollable paranoia or anxiety, self-imposed seclusion, difficulties with sexual intimacy or banal human interactions are all long lasting predicaments that the women have had to struggle with after being detained in segregation. In sum, the aftermath of segregation generally translates into overpowering feelings of inadequacy. Moreover, these feelings appear to be interiorized in a particularly reconstructed or reshaped self-image. Living after segregation often means grappling on a daily basis with such an ‘altered’ self-image” (1999, p. 87).

A Danish study of how parents in prison and their families on the outside cope also touches upon the issue of postisolation effects—not only for the isolated prisoner but also for his or her family. A mother who was arrested and subjected to solitary confinement (according to standard Danish pretrial practice), for example, described how they

came in police cars and took me to prison. I can't let it go. They handcuffed me. I wasn't allowed to see my husband, two months passed before I saw him . . . they told me that the kids were at an institution. They said that they could keep me as long as they pleased. I was in pre-trial solitary for one month, and after that, one month where I was allowed to have visits, except from my husband. . . . Then they told me I was free to go, and that the kids would come home . . . My brother picked me up . . . he took me home where the kids were. . . . The youngest, who was two years old, wouldn't have anything to do with me. In two months time he had forgotten me. It was a very cold feeling. A week went by where he wouldn't have anything to do with me, and it wasn't until after one or two months before he wanted contact with me. . . . When we came home the whole thing was a mess . . . they had searched the house . . . I broke down. I couldn't cope with anything. I think I didn't do anything but sit and cry for half a year. In the end my kids told me, that it had to stop, that I had to do something. . . . But I still cry easily. (Christensen 1999, p. 45; translated by the author)

According to Christensen, the “psychological message is, that the person subjected to solitary confinement risks losing her self and disappearing into a non-existence” (p. 45; translated by the author).

The overall conclusion must therefore be that symptoms generally recede and people generally get better when they get out of solitary confinement. Several studies have suggested this, and some can therefore—upon the termination of isolation—be considered cured in the sense that they exhibit no pathological signs. Some, however, carry with them the negative health effects after the termination of solitary confinement and experience serious social disablement. More research is needed in this area to identify the scope and extent of this problem. Little is likewise known about the suffering experienced by children, partners, and close relatives when their parent or partner is subjected to solitary confinement.

#### IV. Special Issues Concerning Solitary Confinement and Remand Prisoners

Isolation of remand prisoners raises a number of policy issues, which are especially relevant in the pretrial context, most notably relating to suicide and to processing of criminal cases.

*A. The Intense Feeling of Uncertainty*

Solitary confinement during pretrial isolation can be worse than some forms of administrative and disciplinary segregation or isolation because of the overwhelming feeling of uncertainty: when will the isolation end, and how will my case end? (Hinkle and Wolff 1956, p. 129; Jørgensen 1981, p. 3346). A similar feeling of uncertainty can be experienced by individuals in isolation without time limit and has been experienced by POWs subjected to solitary confinement (Deaton, Berg, and Richlin 1977, p. 241).

*B. Solitary Confinement during Pretrial Isolation and the Rate of Suicides*

The initial move from freedom to imprisonment is very stressful. Prisons (or jails) holding remand prisoners face special problems. The initial phase of imprisonment—often pretrial detention—carries with it special psychological hardships. English data clearly identify remand prison populations as a suicide risk group (Liebling 1994, pp. 12–13, 31). According to Andersen and colleagues, the “early phase of imprisonment on remand . . . seems to be a vulnerable phase with changes in symptom scores and emergence and disappearance of psychiatric disorders” (Andersen et al. 2003, p. 175; see also Benjaminsen and Erichsen 2002). Harvey (2004) concludes that the “initial transition into prison was a difficult experience for prisoners.” Problems could be eased by social contact, such as cellmate ties, and “outside social support.” Harvey also concludes that the way that “prisoners formed and maintained social attachment was central to their adaptation.”

The most fatal consequence of the stressful character of the first fourteen days of incarceration is the elevated rate of suicides during this period. A U.S. national study of jail suicides, for example, documented that more than half of suicide victims “were dead within the first twenty-four hours of incarceration” (Hayes 1983, p. 471). In Denmark, around half of all prison suicides are committed during the first two weeks and by remand prisoners (Benjaminsen and Erichsen 2002, p. 17). The suicide rate in the Danish remand prisons is twelve times that of the suicide rate in the general population (p. 16). Danish researchers have argued that isolation constitutes an additional suicide risk factor (Jørgensen 1981, p. 3347; Koch 1982, p. 376). A Danish study reported a disproportionately high rate of suicides among remand prisoners in isolation, but the sample was small, and the author hesitated to draw conclusions (Christiansen 1991, p. 176).

Liebling (1992, p. 51) concludes that a “disproportionate number of suicides occur in special locations, such as prison hospitals, the punishment block and other areas of seclusion.” An American study of 419 suicides in county jails and local jails in the United States during 1979 documented that 68 percent of victims had been “held in isolation at the time of their suicide” (Hayes 1983, p. 471). This use of isolation was not used to avoid collusion as in Scandinavia but was “purportedly intended for inmates who are a danger to themselves and others” (p. 471). Hayes concluded that “the use of isolation enhances the chance of suicide, and it should, therefore, be prohibited” (p. 480). The findings were confirmed seven years later in a study that reported that 67 percent “had been held in isolation prior to their suicides” (Hayes 1989, p. 20). Likewise, a Massachusetts commission concluded in 1984 that “most experts on the subject of inmate suicide agree that placing the detainee in isolation greatly increases the chances of him or her attempting or committing suicide” (quoted from Liebling [1992, p. 150]). A study of suicides in Bavarian prisons (in Germany) between 1945 and 1974 produced similar results: “A much higher risk of suicide was found for the first day of imprisonment . . . [and the] most common method was by hanging in solitary confinement” (Spann, Liebhardt, and Seifert 1979, p. 315). In Finland, “almost one third of the [prison] suicides [1969–92] were committed in isolation rooms” (Joukumaa 1997, p. 167). Research also points toward a connection between isolation and self-mutilation: “An analysis of the 902 self-mutilation incidents in the North Carolina Department of Corrections occurring between 1958 and 1966 revealed that nearly half occurred in segregation units” (Haney and Lynch 1997, p. 525). In 2002, Toch concluded that “segregation increases despondency and self-destructive motives” and pointed out that “suicidologists recommend contact and communication as requisites for suicide prevention” (2002*a*, p. 10).

Still, the rate of suicides (and self-mutilations) among prisoners in different kinds of segregation units could “be an artefact of allocation procedures, which direct suicide risks away from lower security or open establishments” (Liebling 1992, p. 52). But figures concerning suicide rates among Norwegian remand prisoners in solitary confinement more clearly suggest causality (because, as mentioned earlier, Norwegian data show that these prisoners are mentally healthier upon imprisonment than their colleagues in nonisolation). In Norway between 1956 and 1991, three-quarters of all prison suicides were committed

by remand prisoners (Hammerlin 2000, p. 29), and remand prisoners constituted a much smaller proportion of the national prison population—in recent years around one-quarter (Hammerlin 2001, p. 11; Danielsen and Hansen 2002, p. 9). Furthermore, 40 percent had committed suicide during the first three weeks (Hammerlin 2000, p. 29). In 1999, 40 percent of all Norwegian remand prisoners started their imprisonment with restrictions (Hammerlin 2001, p. 11)—meaning none or very little access to communal activities—and according to psychiatrist Tor Gamman, “more than half of all suicides in Norwegian prisons are committed during periods of isolation” (2001, p. 42).

The evidence strongly suggests that use of solitary confinement during the early phases of imprisonment increases the suicide risk and most likely also raises the likelihood of incidents of self-mutilation.

### *C. Practice of Solitary Confinement as Extortion*

It is illegal, according to Danish law, to use solitary confinement and pretrial detention as extortion to coerce suspects into confessing or pleading guilty. It has nevertheless often been claimed that the element of extortion often is very real—both as a motive (for the authorities) and as a reality (for the imprisoned). In 1980, the later Danish minister of justice and then defense attorney and member of the Conservative people’s party, Erik Ninn-Hansen, for example, stated “that solitary confinement today is used less to avoid detainees from communicating with others and more to squeeze out a confession.” Ninn-Hansen observed that “solitary confinement is a commodity” and remand prisoners could free themselves from isolation at the price of a confession (*Politiken* 1980, p. 3; translated by the author).

Many other defense attorneys have claimed the same thing: that pretrial detention—and especially isolation—in reality is (sometimes or often) used as extortion (Petersen 1998, p. 34; Stagetorn 2003, p. 38).<sup>24</sup> In 2000, for example, the Danish defense attorney Manfred Petersen asserted that “solitary confinement is a form of pressure in order to obtain information and/or a confession” (quoted from Thelle and Traeholt [2003, p. 772]).

Professor Rod Morgan, who has assisted the CPT, has pointed to an unfortunate relationship between prisoner confessions and the ter-

<sup>24</sup> Another Danish defense attorney (the fourth quoted for this viewpoint here) stated the same in a radio interview recently (DR [Danmarks radio], in the program “Lige lovligt,” May 6, 2004).

mination of their isolation (according to Gamman [2001, p. 43]). Morgan has written critically of the “Scandinavian way”—the isolation of remand prisoners—which he describes as “reckless” and allowing the police “extreme powers to exploit” (Morgan 1999, p. 204). He concludes that pretrial isolation can be “severely painful” but also seeks to know whether or not “it is purposefully imposed with a view to eliciting confessions, intelligence and other evidence? It is at this point that legal casuistry comes into play. The answer must technically be no—but in practice, the answer is sometimes almost certainly yes” (p. 202).

In other parts of the world, the use of pretrial solitary confinement has long been a well-known extortion technique to inflict psychological pain on remand prisoners in order to force out a confession. This was, for example, the case in the Soviet Union and in South Africa during apartheid (Hinkle and Wolff 1956; Riekert 1985; West 1985; Foster, Davis, and Sandler 1987; Veriava 1989). Communist methods have been analyzed as follows: “When the initial period of imprisonment is one of total isolation, such as used by the KGB, the complete separation of the prisoner from the companionship and support of others, his utter loneliness, and his prolonged uncertainty have a further disorganizing effect upon him. . . . He becomes malleable . . . and in some instances he may confabulate. The interrogator [then] exploits the prisoner’s need for companionship” (Hinkle and Wolf 1956, p. 173). It was for similar reasons—that is, “the effectiveness of indefinite detention and solitary confinement in provoking anxiety and psychiatric instability—that the CIA included [these methods] . . . among its principal techniques of coercion in now repudiated manuals on interrogation from the 1960’s” (Brief of Amici Curiae Human Rights First et al., *Hamadan v. Rumsfeld*, 546 U.S. 05-184 [2005], p. 5). As described from the inmate’s point of view by a South African remand prisoner, “One morning you get up and say to yourself, I’m not going to stand for this any more. I am going to tell them, I’m going to give evidence, providing they just let me out. You’re prepared to do anything to get out of that condition of solitary confinement” (Foster, Davis, and Sandler 1987, p. 140; see also Dr. Louis West’s report “Effects of Isolation on the Evidence of Detainees” in Bell and Mackie [1985, p. 69]).

In 1910, the same (pretrial) effect of solitary confinement was clearly described by the Washington Supreme Court: “The effect of solitary confinement on the mind of a person charged with a crime may be imagined. It is a well-known psychological fact that men and women

have frequently confessed to crimes which they did not commit. They have done it sometimes to escape present punishment which had become torture to them; sometimes through other motives" (*State v. Miller*, 61 Wash. 125, 111 Pac. 1053 [1910]; here quoted from Haney and Lynch [1997, p. 486]).

According to Professor Don Foster and colleagues, "there seems little doubt that solitary confinement for purposes of interrogation, indoctrination or information extraction does have aversive effects and should be regarded as a form of torture" (Foster, Davis, and Sandler 1987, p. 68).

#### *D. Remand Prisoners' Inability to Defend Themselves Legally*

An obvious problem connected with the isolation of pretrial detainees is that solitary confinement hampers their ability to function properly and thereby defend themselves. When remand prisoners suffer some of the above-mentioned health effects, they are less able to speak coherently and thereby to assist their lawyers in preparing a sensible defense.<sup>25</sup> This, of course, constitutes a direct attack on their most basic legal rights.

### V. Conclusion

Solitary confinement can have serious psychological, psychiatric, and sometimes physiological effects on many prison inmates. A long list of possible symptoms from insomnia and confusion to hallucinations and outright insanity has been documented. A number of studies identify a distinguishable isolation syndrome, but there is no general agreement on this. Research suggests that between one-third and more than 90 percent experience adverse symptoms in solitary confinement, and a significant amount of this suffering is caused or worsened by solitary confinement. The conditions of solitary confinement very likely influence the level of distress suffered. The U.S. supermax prisons could be one of the most harmful isolation practices currently in operation.

<sup>25</sup> This has been pointed out by several defense attorneys (see, e.g., Stagetorn 2003, p. 39). In a recent radio interview, a Danish defense attorney explained how isolated remand prisoners in his experience often changed their personality and became more difficult to speak with after around four weeks (DR [Danmarks radio] in the program "Lige lovligt," May 6, 2004). See also Koch (1982, p. 376) and Korn (1988*b*, p. 25). In an English study, prisoners (not remand) found it "hard to talk after long periods of isolation" (Clare et al. 2001, p. 62).

The allocation of mentally ill inmates to supermax prisons (and sometimes to other places of punitive or administrative segregation) is likely to be high, but the prevalence of adverse psychological symptoms in some supermax prisons is clearly significantly higher than even high base expectancy rates for mental illness.

Very different individual reactions to solitary confinement are clearly possible. Some people cope much better than others in isolation. According to some researchers, some inmates can handle even prolonged solitary confinement without displaying any serious adverse symptoms.

Still, the overall conclusion must be that solitary confinement—regardless of specific conditions and regardless of time and place—causes serious health problems for a significant number of inmates. The central harmful feature is that it reduces meaningful social contact to an absolute minimum: a level of social and psychological stimulus that many individuals will experience as insufficient to remain reasonably healthy and relatively well functioning. Prisoners in general prison populations suffer from a high rate of psychiatric morbidity and health problems (inside and outside of prisons), but solitary confinement creates significant additional strain and additional health problems. This was the case in the nineteenth century where Pennsylvania model prisons experienced serious problems with the health of inmates—problems not experienced in the same manner or with the same intensity in Auburn model prisons. The same difference has been documented in contemporary prisons by studies conducted throughout the last approximately thirty years.

Use of solitary confinement in remand prisons can in some ways be considered even worse than the practice of isolating sentenced prisoners. The psychologically stressful and dangerous first two weeks of imprisonment and the disturbing suicide rates in remand prisons illustrate this. The element of effective coercion of guilty pleas from the isolated prisoners is another. The coercion problem, which Rod Morgan compares to “moderate psychological pressure,” makes isolation of remand prisoners a dubious practice (1999, pp. 201–4). Use of solitary confinement in remand prisons can damage the health of citizens who have not been condemned and are still—until the sentence is pronounced—to be considered not guilty.

When one is studying the relationship between time spent in solitary confinement and health effects, negative (sometimes severe) health ef-

fects can occur after only a few days of solitary confinement. The health risk appears to rise for each additional day.

Our knowledge is much more tentative concerning what happens upon release from solitary confinement. Several studies suggest that most negative effects wear off relatively quickly. Other studies identify more or less chronic health effects. Most studies do not address the question of postisolation effects, and more research is clearly needed. Still a number of studies describe how formerly isolated inmates experience significant problems clearly related to their isolation experience—such as difficulties handling social situations and close social and emotional contacts. The only large-scale follow-up study identified less postimprisonment “psychological compensation” among formerly isolated prisoners than among formerly nonisolated prisoners.

#### *A. Policy Implications*

Solitary confinement harms prisoners who were not mentally ill on admission to prison and worsens the mental health of those who were. The use of solitary confinement in prisons should be kept at a minimum. In some prison systems, there is a clear and significant overuse. This is especially apparent in the case of the U.S. supermax prisons. But the use of solitary confinement is problematic elsewhere. While things have improved in Scandinavia in recent years, it is difficult to justify a practice of subjecting pretrial detainees to solitary confinement to avoid collusion, when other Western nations can do without such measures or use this kind of solitary confinement much less. The basic advice must be to avoid using solitary confinement in order to protect ongoing investigations. The police must be able to instigate control measures in order to avoid detainee collusion, but twenty-two to twenty-four hours of isolation should be avoided.

Isolation is simply “not good practice” (Coyle 2002, p. 73). When addressing the most extreme conditions of solitary confinement being used against disruptive prisoners, where inmates have nothing to do, only an hour of outdoor solitary recreation, and are being strip-searched and shackled every time they leave their cell, Coyle concludes that “this method of dealing with prisoners . . . often arises from an absence of proper management techniques” (p. 73).

But regardless of the specific circumstances, and whether solitary confinement is used in connection with disciplinary or administrative segregation or to prevent collusion in remand prisons, effort must be

made to raise the level of meaningful social contacts for inmates. This can be done in a number of ways, such as raising the level of prison staff–inmate contact, allowing access to social activities with other inmates, allowing more visits, and allowing and arranging in-depth talks with prison chaplains, psychologists, psychiatrists, and volunteers from the local community. In Denmark, a prison chaplain has drafted a proposal for revising the restrictions in remand prisons that would disallow strict solitary confinement but rationalize and improve an option of limited isolation. Remand prisoners who were considered likely to engage in collusion would be allowed contact with a selected number of fellow inmates, while being cut off from contact with others. Visits and correspondence would also be strictly controlled. A certain level of meaningful social contact should thereby be secured for all inmates being subjected to limited isolation (Rasmussen 2000, pp. 24–26). A proposal for a Model Segregation Code regulating administrative and punitive segregation of sentenced prisoners has also been drafted (Jackson 1983, pp. 245–50). Prisoners in segregation would be allowed to participate in “programs, services, and activities . . . for no less than six hours per day, which shall include not less than one hour of outside exercise” (p. 249).

It is of course difficult—and most likely impossible—to identify some sort of breaking point: *the* minimum level of social contact needed to avoid the effects of solitary confinement. Research tells us that such a breaking point would be very individual. But it seems fair to conclude that one or two hours of out-of-cell time (even including some social contact) is not enough. Whether three, four, five, or six hours would suffice to eliminate the differences between isolation and nonisolation is not known, but even three hours of out-of-cell time including social contact would most likely create much better and mentally healthier conditions.

#### *B. What We Need to Know*

One important issue, mentioned only briefly, is how staff cultures affect the effects of solitary confinement. Quite a lot of research has been done on prisons and staff cultures, but studies and experiments focusing specifically on the effects of isolation have generally not taken that subject into account. Research dealing more broadly with supermax regimes or other forms of maximum-security confinement have dealt with prison and staff cultures (Clare et al. 2001; Toch 2001,

2002*b*; Rhodes 2004), and it has been argued that the effects of segregation can be ameliorated by influencing staff culture (see, e.g., Toch 2002*b*). Since isolated inmates have little contact with the outside world and meet only staff (and then infrequently), it seems relevant to speculate that the staff culture encountered by an isolated inmate is likely to have a strong effect.

More research into the more dramatic effects of solitary confinement (e.g., hallucinations, major depressions, and psychosis) would be welcome, since the effects of isolation are apparently not only a matter of a higher prevalence of the effects of imprisonment. Isolation appears to be a qualitatively different situation, which can have specific effects of its own. Research in this area would help us specify the exact differences between the effects of imprisonment and the effects of solitary confinement and might also help us identify whether “isolation syndrome” is a relevant diagnosis.

More research into the connection between solitary confinement and suicides and self-mutilations would also be useful. Longitudinal studies with designs that would enable us to analyze the degree and importance of causal connections between solitary confinement and suicidal behavior and self-mutilations would be highly relevant. Base expectancy rates for mental illness would have to be taken into account and control groups used, so that it could be identified to what degree the higher rate of suicides in segregation or isolation is a result of allocation procedures.

One important area left more or less open for future research is the subject of post-solitary confinement effects. While many effects disappear upon termination of solitary confinement, research suggests that there might also be serious postisolation effects, but evidence is relatively scarce. It would also be useful to look for social aftereffects of isolation—such as the possible loss of job and friends, relations with relatives, and so forth—instead of concentrating solely on mental health and outright pathologies. Adrian Grounds (2005) has made a strong argument for rethinking the debate over, and research on, prison effects. Grounds suggests that there might be special effects of long-term imprisonment and argues that “forms of adaptation that are functional in the prison context may be dysfunctional in the postrelease social and family context” (2005, p. 3). He points to the need to take into account the released “individual’s preprison social world and life prospects” and how the outside world has changed during the duration

of the imprisonment (p. 4). These are clearly factors that could be even more important in cases of release from long-term solitary confinement since that kind of isolation arguably removes the imprisoned even further from the outside world. Adaptation to solitary confinement requires an even more intensive and inward psychological process than adaptation to communal imprisonment. The literature on adaptation to isolation under different circumstances—which addresses psychological methods of keeping sane—seems to suggest this (see, e.g., Deaton, Berg, and Richlin 1977). Adaptation to (especially long-term) solitary confinement will in other words *perhaps* tend to create personalities who are more inward and have more difficulty adjusting to social life in the free world than other prisoners. This would be very useful to study not least in the United States, where prisoners are sometimes released directly onto the street from years of supermax imprisonment.

This finally leaves the question of how families are affected by having a parent in long-term solitary confinement. This would clearly be a very relevant subject for research in the United States, where supermax confinement seems likely to have a potentially strong effect on family members of the isolated individual—arguably during as well as after confinement. But this perspective is also relevant in Scandinavia, where arrest and pretrial isolation can cut bonds abruptly and for several months between parents and very young children.

#### APPENDIX

##### A Quantitative Classification of Studies Based on Nonexperimental Data Discussing Solitary Confinement and Health Effects

Only studies based on original research (i.e., new empirical evidence) in prisons are listed in table A1. Furthermore, only studies using real prisoners in real prisons are included in the list. Where authors have presented the same empirical material in different publications, only the first publication (or alternatively the most important study) has been included. A few exceptions exist (as mentioned in the footnotes) in which different authors have published different interpretations of the same corpus of otherwise original data.

The studies have been labeled according to research method:

- i. study based on quantitative data including a control group,

TABLE A1  
Studies Reporting Health Effects

Study	Methodology	Sample Size	Involuntarily Isolated	Study Type No. 1	Study Type No. 2	Study Type No. 3	Conclusions
A. Studies Reporting None or Minor Negative Health Effects							
1. Suedfeld et al. 1982	i	115 <sup>a</sup>	71		X		According to the authors, the data “do not support the view that SC in prisons is universally damaging, aversive, or intolerable” (p. 303)
2. Zinger and Wichmann 1999	i	60	10		X		According to the authors, “this research revealed no evidence that administrative segregation for periods of up to 60 days was damaging” (p. 65)
B. Studies Reporting Serious Negative Health Effects							
1. Andersen et al. 1994	i	367	173			X	Pretrial detention in SC (to avoid collusion) compared with pretrial detention without SC was found to impose additional strain and increase the risk for disturbing the mental health of the imprisoned individuals
2. Andersen, Lillebæk, and Sestoft 1997	i	104	70			X	The 1994 conclusion was supported, and it was recommended, from a medical and psychological viewpoint, not to use SC to avoid collusion during pretrial detention

3. Benjamin and Lux 1975	iv	2 (?) <sup>b</sup>	2 (?)	X	The use of “forced isolation” at Maine State Prison was found to cause “a severe deterioration of psychological functioning” (p. 89)
4. Brodsky and Scogin 1988 <sup>c</sup>	ii–iv	69	?	X	Protective custody was found to have “strong potential for harmful effects” and could “deprive the inmates of the opportunity to engage in the behaviors that allow us to define who we are.” Therefore, “sufficient stimulation and activities” should be provided “to ensure the psychological well-being of the prisoners” (pp. 279–80)
5. Fellner and Mariner 1997	iv	41 (121)	41 (121) <sup>d</sup>	X	Many prisoners in the sample suffered from serious mental disorders, but most “had previous histories of mental disorder.” Still, it was concluded that the condition of these prisoners “was exacerbated by confinement at the MCF and SHU” and a causal link between isolation and adverse effects was thereby proposed (p. 70)
6. Foster, Davis, and Sandler 1987	iv	158	125 <sup>e</sup>	X	X <sup>f</sup> The authors concluded that “there can be little doubt that solitary confinement under these circumstances [in South Africa] should in itself be regarded as a form of torture” (p. 136)

TABLE A1 (Continued)

Study	Methodology	Sample Size	Involuntarily Isolated	Study Type No. 1	Study Type No. 2	Study Type No. 3	Conclusions
7. Gamman 2001 (1993) <sup>g</sup>	ii	63	63			X	Widespread health problems were found after four weeks of SC, including depressions, anxiety, stomach and muscle pains, lack of ability to concentrate, etc. (inmates with obvious withdrawal symptoms and those deemed in risk of suffering from a psychosis had been excluded from the sample)
8. Gamman 1995	i	54	27			X	“The results showed that secluded prisoners had more health problems than prisoners serving less restrictive prison sentences did. The most usual complaints were headache, pain in the neck, stomach and shoulders, anxiety and depression” (p. 2243). SC inmates were also given and used much more medication than the control group
9. Grassian 1983	iv	14	14		X		The author found that severe symptoms were caused by SC and asserted “that these symptoms form a major, clinically distinguishable psychiatric syndrome” (p. 1450)

10. Gray 1847	i + iv <sup>h</sup>	4,000+	4,000 <sup>i</sup>	X	The author concluded “that from the experience of our own country hitherto, it appears that the system of constant separation [SC according to the Pennsylvania model] as established here, even when administered with the utmost humanity, produces so many cases of insanity and of death as to indicate most clearly, that its general tendency is to enfeeble the body and the mind” (p. 181)
11. Haney 2003 <sup>j</sup>	ii	100	100	X	Considerable and severe effects of SC were found with very high prevalence rates. For example, 91 percent suffered from anxiety and nervousness, and 70 percent “felt themselves on the verge of an emotional breakdown” (p. 133). 77 percent were in a state of chronic depression and two-thirds of the inmates suffered from many different symptoms at once
12. Hinkle and Wolff 1956	iv	Classified	Classified <sup>k</sup>	X	An isolation regimen was found to produce anxiety, depression, illusory experiences, visual hallucinations, and in some cases psychosis. Insanity was normally avoided by breaking the routine of total isolation, and the lesser effects were “usually sufficient to make the prisoner eager to talk to his interrogator and to seek some method to escape from a situation which had become intolerable” (p. 129)

TABLE A1 (Continued)

Study	Methodology	Sample Size	Involuntarily Isolated	Study Type No. 1	Study Type No. 2	Study Type No. 3	Conclusions
13. Jackson 1983	iv	7	7		X		Severe effects of long-term SC were found including anger, violence, hallucinations, and insanity
14. Jensen et al 1980 <sup>a</sup>	iv	46	46			X	The authors agreed that the collected data described "very serious mental and social effects of pre-trial isolation" (p. 5; translated by the author)
15. Jørgensen 1981 <sup>1</sup>	iv	46	46			X	The author found SC to cause severe symptoms including anxiety, depressions, hallucinations, and insanity, and claimed to identify both an acute and a chronic isolation syndrome
16. Koch 1982 <sup>m</sup>	iv	50	50 <sup>n</sup>			X	The author identified short-term effects of SC such as "concentration and memory difficulties, lack of ability to sleep, psychosomatic symptoms etc." and long-term effects (after a few weeks) such as "depersonalization, lack of emotional control, anxiety, hallucination and paranoia" (p. 382)

17. Korn 1988 <i>a</i>	iv	5	5	X	The author reported serious psychological and psychosomatic effects caused by the confinement including severe depressions, hallucinations, anxiety, apathy, loss of weight, and dizziness
18. Korn 1988 <i>b</i>	iv	5	5	X	The author reported serious psychological and psychosomatic effects caused by the confinement including severe depressions, hallucinations, anxiety, apathy, loss of weight, and dizziness
19. Martel 1999	iv	12	12	X	According to the author, the experiences reported “suggest that segregation produces substantial and sometimes lasting, debilitating outcomes for” inmates (p. 101) and “the effects of these conditions are damaging and reach far beyond the original intent of segregation policies” (p. 104)
20. Rhodes 2004	iv	122/87	122/87°	X	The author describes effects of SC, including hallucinations, anger, and uncontrolled thought processes and relates how prison staff are in a sense to protect prisoners “from the prison itself” (p. 110)

TABLE A1 (Continued)

Study	Methodology	Sample Size	Involuntarily Isolated	Study Type No. 1	Study Type No. 2	Study Type No. 3	Conclusions
21. Sestoft et al.1998 <sup>p</sup>	i	345	152			X	If "a person remained in SC for 4 weeks the proportionality of being admitted to the prison hospital for a psychiatric reason was about 20 times as high as for a person remanded in nSC [non-solitary confinement] for the same period of time" (p. 103)
22. Smith 2004 <sup>a1</sup>	ii + iv	300/3,000+	300/3,000+ <sup>r</sup>		X		At least around a third of the inmates suffered from symptoms such as, e.g., lethargy, anxiety, and hallucinations, which were found to be caused mainly by SC. These symptoms were being treated by allowing, e.g., extra out-of-cell time and limited social contact for certain inmates
23. Stang et al. 2003	i	60	30	X			The study did not assess the effects of solitary confinement as such, but reported extensive and severe mental health problems during imprisonment in segregation, such as depressions and hallucinations

24. Toch 1992	i + iii	600	An unknown number of these were in solitary confinement	X	Toch use the term “isolation panic” and describes a range of symptoms including panic, rage, loss of control, and complete breakdown. According to Toch, “isolation removes even the coping resources ordinarily available in prisons” and can “dramatize the pains of imprisonment per se.” Isolation panic can therefore mark “a dichotomy in the minds of inmates—a distinction between imprisonment, which is tolerable, and isolation, which is not” (pp. 48–54)
25. Volkart, Rothenfluth, et al. 1983	i	203	78	X	“Remand prisoners in solitary confinement are proportionally much more often in need of psychiatric hospitalization compared to sentenced prisoners not in solitary confinement” (p. 374; translated by the author) <sup>a</sup>
26. Volkart, Dittrich, et al. 1983	i	58	30	X	The group of isolated inmates “showed considerably more psychopathological symptoms than the control group . . . [and these] effects were mainly caused by solitary confinement; age, schooling, duration of detention and personality turned out to be of subordinate importance” (p. 44)

<sup>a</sup> This study could also be listed among the studies reporting substantial health effects—because it does report substantial health effects (pp. 316, 331)—but the authors claim that these effects are not objective and not caused by solitary confinement.

TABLE A1 (Continued)

Study	Methodology	Sample Size	Involuntarily Isolated	Study Type No. 1	Study Type No. 2	Study Type No. 3	Conclusions
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<sup>b</sup> The total number of inmates studied is not mentioned in Benjamin and Lux (1975), but two prisoners from the segregation unit are quoted at length.

<sup>c</sup> A study of protective custody, which therefore could be difficult to compare with the other studies mentioned here.

<sup>d</sup> According to the report, researchers met approximately forty prisoners in one facility in 1995 and approximately forty prisoners in another facility in 1996 (out of whom twenty participated in extended interviews). But only forty-one inmates (in the two facilities in 1997) were subjected to structured psychiatric assessment. Most of the inmates in this Human Rights Watch study were mentally ill prior to their isolation (in disciplinary or administrative segregation), and the authors were therefore not able to establish whether solitary confinement produced mental disorders. But as explained in the table, they concluded that “their condition was exacerbated by confinement at the MCF and the SHU” and described cases of panic attacks, sleeplessness, anger, paranoia, confusion etc. (Fellner et al. 1997, p. 35).

<sup>e</sup> The sample made by Foster (professor in psychology) and colleagues consists of 175 cases of detention involving 158 individuals. 79 percent of the detentions involved solitary confinement, so I have applied this percentage to the number of individuals (158). My result (125) is of course not likely to be completely correct.

<sup>f</sup> This study deals only with remand prisoners but deals with many other issues than just solitary confinement and is therefore—in the terminology used here—both a prison study and a study of the effects of solitary confinement on remand prisoners.

<sup>g</sup> Gamman’s (1993) study (and the 1995 study) is described in Gamman (2001).

<sup>h</sup> Parts of Gray’s study—like his statistics on death rates and insanity—are quantitative and with control groups; other parts of his study are qualitative.

<sup>i</sup> Gray deals with isolated prisoners from many Pennsylvania-type prisons. The total number of prisoners is unknown but exceeds 4,000.

<sup>j</sup> Haney’s own sample (100 SHU prisoners) is from an earlier study, but the data are further analyzed and compared with other studies in Haney (2003).

<sup>k</sup> The material used was confidential but included, among other things, systematic and longitudinal observations of prisoners after their release.

<sup>l</sup> This study is based on analysis of documentation (cases) presented in Jensen, Jørgensen, and Rasmussen (1980*a*, 1980*b*).

<sup>m</sup> This study is partly based on analysis of documentation (cases) presented in Jensen, Jørgensen, and Rasmussen (1980*a*, 1980*b*), but also on forty-seven interviews with women remand prisoners, many of whom were isolated (Koch 1982, p. 374).

<sup>n</sup> According to Koch, her material consists of “more than fifty cases.” She also states that she has interviewed remand prisoners who were not in solitary confinement, and her study can in that sense perhaps claim to have a control group element.

<sup>o</sup> The medical records of 122 inmates were used, and eighty-seven were interviewed (Rhodes 2004, p. 229).

<sup>p</sup> This study was originally part of Andersen et al. (1994). But a somewhat stronger conclusion was reached, and a more direct criticism of the use of SC was communicated.

<sup>q</sup> The main study is in fact Smith (2003), but since my 2004*b* article gives an account of the health effects of solitary confinement in English, I have chosen to cite that one.

<sup>r</sup> Different calculations are based on different samples in this study. Some illness rates are based on a sample of 300 prisoners and another on a sample of 1,596 prisoners. In all more than 3,000 prisoners passed through the prison in the period in which all available medical reports etc. were read.

<sup>s</sup> “Untersuchungs-Einzelhäftlinge [werden] proportional viel häufiger psychiatrisch hospitalisierungsbedürftig als Gemeinschaftshäftlinge des Strafvollzugs.”

- ii. study based on quantitative data without control group,
- iii. qualitative study (e.g., based on in-depth interviews) with control group, and
- iv. qualitative study (e.g., based on in-depth interviews) without control group.

Some studies can of course be termed both quantitative and qualitative. Finally, the number of participants in the study, the number of involuntarily isolated prisoners, and the type of study (or subject) are noted. Three different types/subjects are acknowledged: (1) prison studies that deal with several issues but also report on the effects of solitary confinement, (2) studies that deal primarily or solely with the effects of solitary confinement in prisons, and (3) studies that deal primarily or solely with the effects of solitary confinement in remand prisons.

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