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## The Case of Jeffrey Dahmer: Sexual Serial Homicide from a Neuropsychiatric Developmental Perspective\*

**ABSTRACT:** Sexual serial homicidal behavior has received considerable attention during the last three decades. Substantial progress has been made in the development of methods aimed at identifying and apprehending individuals who exhibit these behaviors. In spite of these advances, the origins of sexual serial killing behavior remain for the most part unknown. In this article we propose a biopsychosocial psychiatric model for understanding the origins of sexual serial homicidal behavior from both neuropsychiatric and developmental perspectives, using the case of convicted serial killer Jeffrey Dahmer as the focal point. We propose that his homicidal behavior was intrinsically associated with autistic spectrum psychopathology, specifically Asperger's disorder. The relationship of Asperger's disorder to other psychopathology and to his homicidal behavior is explored. We discuss potential implications of the proposed model for the future study of the causes of sexual serial homicidal crime.

**KEYWORDS:** forensic science, Jeffrey Dahmer, forensic psychiatry, serial killers, paraphilias, necrophilia, anthropophagia, necrophagia, cannibalism, fetishism, Asperger's disorder, pervasive developmental disorders, autism, murder, homicide, aggression, violence, theory of mind, psychopathy, antisocial personality disorder, schizoid personality disorder

Serial killing has become a topic of great interest and intensive discussion in modern western society (1). This phenomenon is highlighted by commentators, especially in the United States, who have rushed, perhaps a bit too hastily, to view serial killing as an "all-American" phenomenon (2, p. 4). If, in fact, serial killing "has become as American as apple pie," as has been suggested (3, p. 166), then Jeffrey Dahmer (JD), convicted sexual serial killer, may in a twisted but decisive way own a noteworthy portion of that pie. Dahmer's life has become a social narrative that tempts and compels us to explain the nature of such beings. But in our rush to explicate, labels often applied to serial killers such as "monster," "evil," and "cannibal" (4), while helping us reduce our existential anxieties, may also lure us into a false sense of knowing. If, as writer Richard Tithecott has proposed (2), JD has become an icon for a seemingly unavoidable, albeit dark, defining feature of the human condition, then the pervasive fascination with serial killing and JD's case in particular should come as no surprise. Whether we like it or not, JD has considerably influenced ongoing dialogue concerning serial killing behavior that reaches not only the realm of the forensic sciences, but also extends into areas such as the humanities and cultural studies (2,5). However, this situation runs the

danger of creating an enigma that simultaneously demands clarification but is endowed with some numinous qualities of the human condition. Therefore, any search for paradigms that provide novel approaches for understanding serial killing behavior may be refreshingly welcome. In this study we use the life history method as a means to explore the origins of serial killing behavior.

We study the case of serial killer JD from a combined developmental and neuropsychiatric perspective and hope to facilitate further dialogue regarding the origins of sexual serial killing behavior. Our exploration focuses on the role that autistic spectrum psychopathology, also known as pervasive developmental disorders (6), may have had in the development of JD as a serial killer. More specifically, we argue that he suffered from a form of high-functioning autistic psychopathology, namely Asperger's disorder (7-9) and that serial killing behavior can become more clearly clarified under one comprehensive paradigm that is becoming increasingly understood from perspectives grounded in neuropsychiatry, evolutionary psychology, and developmental psychology. This multi-modal perspective has the potential to view serial killing behavior under a well-integrated biopsychosocial infrastructure. There are several reasons why adoption of this approach in the study of serial killing behavior should prove feasible. First, the application of case study methodology for the study of serial killers that are deceased has, of course, a long and fruitful tradition (10-13). Second, recent scholarly work on individuals from other historical periods who may have suffered from autistic spectrum disorders suggests that the postmortem biopsychosocial study of individuals afflicted with these conditions is also feasible (14-16). Third, JD, while no longer living, is a contemporaneous figure who died in 1994 (4) and relevant information on him is fairly extensive. Fourth, JD is a serial killer who was extensively investigated from various relevant psychiatric perspectives while he was still alive (17-19). And, finally, the diagnostic and biological characteriza-

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tion of autistic spectrum disorders including AD has made impressive progress in the last two decades (8,20,21). Although we caution that the diagnostic classification of autistic spectrum disorders continues to be unsettled regarding the differentiation of AD from other forms of autistic spectrum disorders such as autistic disorder (9,22), the diagnosis of AD can be made in many affected individuals. Although we make principal use of the most recent version of the *Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association* (DSM-IV-TR, 6), we also show that all-important diagnostic systems for AD were utilized in order to stress the degree of consistency achieved in diagnosing JD within the autistic spectrum of psychopathology (8). We then discuss the role that other important factors such as psychopathy, mood psychopathology, substance abuse, and stress may play in the origin of serial killing behavior within the context of JD's autistic psychopathology. We also provide an overview regarding how the neuropsychiatric developmental paradigm of autistic spectrum disorder may shed light on the study of serial killing behavior. Finally, we propose some areas of potential exploration that may prove fruitful in the study of serial killing behavior viewed from the proposed developmental neuropsychiatric context.

### Case History

Jeffrey Dahmer was born on May 21, 1960 to chemist Lionel Dahmer and his wife Joyce Dahmer. It is well known that JD was the product of a pregnancy complicated by the fact that his mother suffered from disabling protracted nausea, anxiety, and dysphoria coupled with his mother's use of prescribed tranquilizers (23). We are especially fortunate in that Lionel Dahmer, JD's father, wrote not only a courageous but also a profound memoir that provides us with a rich window into JD's early life and psychopathology (23). According to Lionel Dahmer, JD appeared different from other children. From a very early age JD was noted to have difficulties with appropriate eye gaze behavior, displayed facial expressions devoid of emotional glow, and had a certain motionlessness of his mouth (23,24). Lionel Dahmer described his son as having body posture that made him appear rigid, unusual in the straightness of his body with a sense that the knees were locked and the feet dragging stiff (23,25). Essentially, JD exhibited a type of bodily awkwardness that was oddly reminiscent of a dearth of life force not inconsistent with a stereotype of the "zombie-like" person, a notion that would occupy JD's interests later in his life. Such motoric oddness and clumsiness may lead to the impression of JD as reminiscent of the robotic or as a killer that can be likened to an "unfeeling, programmed machine" (2, p. 98).

By six years of age he was described by his father as a quiet boy who became increasingly inwardly drawn and who failed to negotiate developmentally appropriate peer relationships as a child and adolescent. As an elementary school child he was reclusive (23). As an adolescent he made superficial contact with others but was viewed by his father and his peers as isolative and socially inept (17). As early as age four or five, JD did not appear interested in participating in activities emanating from his social environment. By age 15 years, his father described him as a child who had rejected all efforts to develop interests in the world that his father attempted to introduce (23).

Jeffrey Dahmer was not only reclusive and seemingly shy, but his range of emotional expression appeared limited. Consequently, he was viewed as being emotionally disconnected in his interactions with others (17). His emotional sense of detachment was fairly evident during his trial (26). During his two-year stay in the

Army, he was also perceived as emotionally distant. As a homosexual adult, he was able to physically approach other males in gay bars but was unable to form any close relationships (17,24–27).

Although JD was able to pursue various socially based activities such as sports and music appreciation (17,23,28), interests that could have led to friendships, he usually managed to transform them into distinct asocial pursuits or to drop them from his interest (23). For the most part, he had serious difficulties participating in social processes that involved an authentic give and take, bi-directional flow of shared information. Not surprisingly, he was perceived as being aloof and friendless (25,26). His father thought that JD suffered from a vague but pervasive form of social dread since early childhood partially rooted in a deep dislike for significant change in the physical and social worlds. JD felt most comfortable with routines (23).

Lionel Dahmer recalled that a crawl space under the home had been cleaned of dead rodents and consequently JD had collected the rodent bones in a bucket. Four-year-old Jeffrey "had taken a great many of the bones from the bucket and was staring at them intently. From time to time, he would pick a few of them up, then let them fall with a brittle crackling sound that seemed to fascinate him. Over and over, he would pick up a fistful of bones, then let them drop back into the pile that remained on the bare ground. He seemed oddly thrilled by the sound they made" (23, p. 53). Lionel Dahmer appropriately surmised that his observation may have only been an inoffensive passing fascination of childhood. However, his son continued to develop a focused interest with bones, dead bodies, and bodily parts. JD appears to have developed first an interest in collecting dead insects that eventually blossomed into collecting bodies of higher animals (26). He was interested in both external and internal anatomy (24), and by age 10 he displayed a vigorous interest in the exploration of internal animal anatomy. He also derived satisfaction from focusing on parts, in his case, animal body parts (17,26). Clearly by the time that he was in high school, he had well-developed interests in collecting animal bones and chemical processing of dead animals (17). JD had, in fact, been influenced by his father in that the latter had introduced him to chemistry, including the knowledge regarding the nature of corrosive acids. But it was up to JD to consistently apply his newfound knowledge in the service of dissolving animal flesh and preparing skeletons cleansed of all flesh (25). In later years he would graduate into human objects and develop an impressive collection of body parts or human trophies obtained from the bodies of the people that he killed. He became obsessively interested in the mechanics and process of exploring cadavers as human bodies, a practice that was dramatically highlighted by his series of photographic records of the dissection process. He was essentially a cadaver collector with an added interest in human body parts, which he partially viewed as endowed with existential and sexual meaning. Therefore, to JD it would have been unusual, if not unthinkable, to abandon a human cadaver that he happened to like (28). However, a decisive difference between his childhood and early adolescence and his later life is the fact that he sexualized his fixated activity on bodies and bodily parts, thereby endowing them with not only existential meaning but sexual satisfaction (29). Scholar Brian Masters conceptualizes JD's necrophilia as a fusion of two cognitions, one that involved interests in the internal anatomy of the human body and one that viewed the ideal sexual object as a function of "an intimate relationship with an admirable and beautiful *thing* [italics by author]" (17, p. 40), a situation which in our opinion represented for JD a love object devoid of freedom and therefore totally compliant (25).

His social ineptness and narrow unusual interests, needless to

say, were associated with serious life-long dysfunction not only in the social but also in the educational and occupational areas (17,23–25,28). There were no significant delays in language acquisition. However, due in part to his remarkable lack of interests in general, he did poorly in school and failed in college. JD was thought to be intelligent and had well-developed basic self-help skills, and as a child he was able to explore his physical environment reasonably well (17,28). At approximately age four, he developed a hernia and underwent successful surgical repair. JD was otherwise physically healthy throughout his lifetime. Also, to our knowledge, he was never diagnosed with schizophrenia or with a pervasive developmental disorder. However, at least one psychiatrist diagnosed him as being delusional (3).

Jeffrey Dahmer developed compulsive masturbation by the time he reached adolescence. Concerning his psychosexual history as an adult, he had exposed himself in a sexual manner to adults and minors and had reportedly masturbated in public, a behavior that eventually led to legal difficulties (25,26). Not surprisingly, JD's repeated engagement in sexual intercourse and involvement in other sexual behaviors with the cadavers of his victims led several mental health professionals to diagnose him with necrophilia (3,18,24). However, forensic psychiatrist Phillip J. Resnick, who also evaluated JD for the prosecution, remains of the opinion that JD did not suffer from primary necrophilia because JD preferred live sexual partners (30,31). JD also displayed a tendency to experience recurrent depressive affect, low self-esteem, and suicidal ideation. He was treated with antidepressant medication (28). He developed a serious problem with alcohol consumption by early to middle adolescence. During military service, he frequently drank alcohol and was discharged from the Army due to alcohol-associated difficulties in occupational performance. He tended to become belligerent while drinking alcohol, and his homicidal behavior usually took place in the context of alcohol use (25).

Concerning his family history, his father reported a similar though more adaptive pattern of psychological difficulties in himself. JD's father had developed obsessional patterns, except that his father's case involved a fascination with fire that later developed into an interest in bombs. Also, since a very early age, JD's father suffered from intense shyness, described by him as a vague but threatening fear of the social world and even buildings. He yearned for "complete predictability, for rigid structure" (23, p. 64), explaining, "The subtleties of social life were beyond my grasp. When children liked me, I did not know why. Nor could I formulate a plan for winning their affection. I simply didn't know how things worked with other people. There seemed to be a certain randomness and unpredictability in their attitudes and actions. And try as I might, I couldn't make other people seem less strange and unknowable. Because of that, the social world seemed vague and threatening. And, as a boy, I had approached it with a great lack of confidence, even dread" (23, pp. 64,65). However, to a significant extent, JD's father was able to cope with his problems and fears and direct his interests toward chemistry, a field that satisfied his need for preserving order and provided him with a source of livelihood and self-esteem (17,23,26). JD's mother appeared to have suffered not only from anxiety and mood lability but also from intermittent episodes of depression (17,23).

## Discussion

### *Jeffrey Dahmer as a Case of Asperger's Disorder*

Many investigators of homicidal behavior postulate that part of the genesis of serial killing behavior likely contains childhood and

adolescent antecedents of both a psychological and a social nature (12). Frequently, the psychosocial roots of serial killing behavior are explained via stressful events, especially during the early life cycle (12). Also, the idea that serial killing may be associated with neuropsychiatric factors has been acknowledged, though infrequently explored or studied (12). In our opinion, the available information regarding JD is consistent with the notion that a neuropsychiatrically determined developmental process was intrinsically involved in the genesis of his sexual serial homicidal behavior. However, in order to provide a clear exposition of this thesis, we must first provide convincing evidence that JD had, in fact, suffered from a developmental disorder associated with a definable set of psychological criteria. Our previous overview of JD's life indicates that he suffered from a constellation of psychological difficulties that can be traced back to his childhood. More specifically, we provide a discussion that indicates that JD suffered from an autistic spectrum developmental disorder most consistent with Asperger's Disorder (6,32–36). Currently in the DSM-IV-TR, Asperger's disorder (AD) is considered to be a pervasive developmental disorder differentiable from autistic disorder. However, AD is thought by many to lie within the same realm of psychopathology as autism, in which autistic disorder represents a more disabling version of the problem (8,37). Therefore, both autistic disorder and AD are thought to lie within the autistic or pervasive developmental spectrum of psychiatric disorders (6,8,9,37).

According to DSM-IV-TR and other nosological systems, we have the following:

1. AD is partially characterized by impairment in social interaction. In JD's case, he was known to lack reciprocal social behavior, a situation that was closely linked to his inability to make close friendships with his peers. His social disability also was illustrated by his inability to participate in the interests of others. He was more interested in forcing others to become part of his own bizarre isolated world on his own terms. This was dramatically highlighted by his desire to turn people into "zombies" in order to have others conform to his will. As already described in JD's case history, his difficulty with nonverbal communication such as a dearth of facial expression and his unusual gaze were also consistent with nonverbal social deficits often encountered in AD (8,38–40), a finding that was noted in JD since early childhood (17,23).
2. Individuals with AD also can present with unusual body kinetics that have been variously described as a general bodily awkwardness or as a mechanical-like type of body posture (41–43). In JD's case, his unusual rigid body kinetics had been evident since early childhood (23).
3. AD is also characterized by an intense preoccupation with restricted and repetitive interests that appear atypical, eccentric, or even bizarre on the basis of both intensity and focus (6,8), and in JD's case this was dramatically highlighted by his obsessive and compulsive interests in animal and, in later life, human bodies and their component parts. Moreover, he manifested an adherence to specific repetitive behaviors such as listening to internal body sounds and performing ritualistic processing and arrangement of bones, activities which, though idiosyncratically meaningful to JD, presented with little adaptive value (17,23). According to DSM-IV-TR, the above-mentioned deficits characteristic of AD must cause clinical impairment in social, occupational, or other important areas of functioning (6). Although AD and its associated deficits were initially discovered in children, presently AD is increasingly being identified in

adults, where it is also known to cause significant disabilities (44). In JD's case, his life was characterized by poor school performance, poor performance during military service leading to his eventual discharge, and his inability to acquire a skilled job in spite of his above average to high IQ. Moreover, he was unable to develop any long-term relationships of either a homosexual or a heterosexual nature (17,26).

4. The DSM-IV-TR requires that in contradistinction to autistic disorder that AD be diagnosed only in the absence of a clinically significant delay in language development. As previously mentioned, JD presented with no gross abnormalities in language development (23).
5. The DSM-IV-TR exclusion criteria for a diagnosis of AD include the absence of clinically significant delay in cognitive development or in the development of age appropriate self-help skills, absence of other pervasive developmental disorders, and absence of schizophrenia. AD may be diagnosed in an individual who had clear indications for this diagnosis provided that any symptoms indicative of schizophrenia only appeared subsequent to the AD symptoms (6). JD clearly fulfilled this criterion.
6. The symptoms of AD tend to be recognized at age three or shortly thereafter (6,8), which is consistent with the report by JD's father, who noted JD's symptoms by around age four (23).
7. AD tends to be associated with the tendency for repetitive thinking and behaviors, characteristics that it shares with autistic disorder (6). These findings have led some investigators of autistic spectrum disorders to place these disorders within the framework for obsessive-compulsive psychopathology (45,46). JD's persistent interests in human bodies and their component parts are consistent with repetitive psychopathologies. The DSM-IV-TR criteria met by JD are summarized in Table 1. He also met diagnostic criteria for AD from other well-known nosological systems, including that of Asperger's original criteria

(7,8,32,36,47, see Table 2). Nonetheless, it should be emphasized that DSM-IV-TR provides perhaps the most stringent criteria for AD (6,7).

#### *The Relation of Asperger's Syndrome to Sexual Psychopathology*

If, in fact, JD suffered from AD as the available information indicates, then it follows that both specific developmental and neuropsychiatric factors thought to be associated with AD may help shed some light on JD's homicidal and necrophilic behaviors. In other words, JD's homicidal and/or necrophilic behaviors may be related to psychological, neuropsychiatric, and developmental abnormalities. Necrophilia, which involves various degrees of sexual activities and/or interests associated with deceased bodies (6,48–50), may in JD's case be causally related to AD, because necrophilia often constitutes a repetitive and stereotyped pattern of behaviors, interests, and activities associated with inflexible maladaptive routines, including a persistent sexual preoccupation with human bodies and their component parts. However, it should be emphasized that JD's necrophilia (i.e., creation, collection, and utilization of cadavers and their component parts) is a sexualized form of the repetitive behavioral patterns typically encountered in AD. Available information also indicates JD already displayed these preoccupations prior to adolescence albeit in a non-sexualized form (i.e., collection and utilization of animal bodies and parts) (17,23). This information suggests a conceptual connection of some forms of necrophilia to a neuropsychiatrically based developmental disorder (21). Therefore, AD can potentially serve as a conceptual bridge for understanding a specific paraphilia as a function of a neuropsychiatric developmental paradigm, namely autistic spectrum disorders. Likewise, JD's sexual fetishism can be explained via the same neuropsychiatric developmental model. According to traditional sources as well as DSM-IV-TR, in human body part sexual fetishism or partialism (6,51) the affected individual may fixate on a focused set of body parts or areas, a view consistent with psychiatrist Gerson Kaplan's view that, "Jeffrey Dahmer has also stated that he had sexual contact with the dead victims and their dismembered bodies. This can be understood as a way of reliving the sexual contact he had with the victims before he killed them. The body part represents the victim, just as another man might use a woman's underwear to represent the woman and then masturbate with the underwear" (52, p. 231). JD's obsessional preoccupation with body parts, a process that eventually became sexualized during adolescence, represent a psychopathological process consistent with some of the restricted preoccupation of thoughts and behaviors characteristically intrinsic to AD (6,34,47). In contradistinction to views that JD's fetishistic necrophilia is intrinsically linked to sadism (19) and to psychoanalytic perspectives that conceptualize sexual perversion as intrinsically linked to hostility (53), our proposed explanation depends more on a developmental concept that views sexual fetishism as a defective integration of appreciation of human objects, their anatomical and social contexts, and related neural substrates. For example, children with AD and classic autism appear to employ face-processing strategies that rely on component facial properties rather than viewing the face as a whole (54). Deficits such as these may in turn lead some individuals who suffer from autistic spectrum psychopathology to view and cognize human objects as physically and psychologically fragmented (55), giving rise to psychopathologies that depend on deconstruction of sexual objects such as is the case of fetishism for inanimate objects and partialism. Furthermore, high-functioning autistics may have more difficulties processing unfamiliar faces (56), a situation that may encourage some affected individuals to

TABLE 1—DSM-IV-TR diagnostic criteria for Asperger's disorder.

- A. Qualitative impairment in social interaction, as manifested by at least two of the following:
  1. Marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction (+).
  2. Failure to develop peer relationships appropriate to developmental level (+).
  3. Lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (+).
  4. Lack of social or emotional reciprocity (+).
- B. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:
  1. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus (+).
  2. Apparently inflexible adherence to specific, nonfunctional routines, or rituals (+).
  3. Stereotyped and repetitive motor mannerisms (–).
  4. Persistent preoccupation with parts of objects (+).
- C. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning (+).
- D. There is no clinically significant general delay in language (+).
- E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than in social interaction), and curiosity about the environment in childhood (+).
- F. Criteria are not met for another specific pervasive developmental disorder or schizophrenia (+).

NOTE: + = present in Dahmer's case; – = Absent in Dahmer's case.

TABLE 2—Asperger's disorder diagnostic configuration as a function of diagnostic system.

Asperger's Disorder Criteria	A	B	C	D	E	F	G
A. <i>Social Impairment</i>	+	+	+	+	+	+	+
1. Nonverbal communication deficits	+	+	+	+	+	+	+
2. Failure to develop peer relationships	+	+	+	+	+	+	+
3. Lack of social sharing	+	+	+	+	+	+	+
4. Lack of social/emotional reciprocity	+	+	+	+	+	+	+
B. <i>Restricted/repetitive patterns</i>	+	+	+	+	NA	+	+
1. Pervasive preoccupation with stereotyped and restricted patterns of interest of abnormal intensity and focus	+	+	+	+	NA	+	+
2. Apparently inflexible adherence to specific, nonfunctional routines or rituals (all-absorbing interest)	+	+	+	+	NA	+	+
3. Stereotyped/repetitive motor mannerisms	—	—	—	+	NA	I	—
4. Persistent preoccupation with parts/objects	+	+	+	+	NA	+	+
C. <i>Social/occupational/other dysfunctions</i>	+	+	+	+	+	+	+
D. <i>Language and communication criteria</i>	+	+	+	+	+	+	+
1. No language and communication deficits	NA	NA	NA	NA	NA	+	+
2. <i>Language delays</i>	+	+	+	+	+	+	NA
3. <i>Poor prosody and pragmatics</i>	+	+	+	+	+	NA	NA
4. <i>Idiosyncratic language</i>	+	+	NA	NA	NA	NA	NA
5. <i>Impoverished imaginative play</i>	+	+	NA	NA	NA	NA	NA
E. <i>Motor clumsiness</i>	+	+	+	+	NA	+	+
F. <i>No cognitive delays</i>	NA	NA	NA	NA	NA	+	NA
G. <i>Absence of other pervasive developmental disorders</i>	+	NA	NA	NA	+	+	+
H. <i>Absence of schizophrenia</i>	NA	NA	NA	NA	NA	+	+

NOTE: A = Asperger (1944); B = Wing (1981); C = Tantam (1988); D = Gillberg and Gillberg (1989); E = Szatmari et al. (1989); F = ICD-10 Research Criteria (1993); (REF), G = DSM-IV-TR (APA, 2000). Asperger and Wing did not provide an explicit nosological system for diagnosing Asperger's disorder. The above provided criteria follow closely their respective descriptions of the disorder. + = criterion met; — = criterion not met respectively; I = inadequate information to score the criterion; NA = that rating of a criterion was not applicable for the given diagnostic system.

TABLE 3—DSM-IV-TR multi-axial diagnosis for Jeffrey Dahmer.

Axis I. *Clinical Disorders/Other Conditions that May Be a Focus of Clinical Attention*

1. Asperger's disorder.
2. Paraphilia not otherwise specified (necrophilia).
3. Alcohol abuse.
4. Depressive disorder not otherwise specified.

Axis II. *Personality Disorders/Mental Retardation*

1. Personality disorder not otherwise specified (with antisocial, schizoid, and schizotypal personality disorder traits).

Axis III. *General Medical Conditions*

1. No Major Medical Conditions.

Axis IV. *Psychosocial and Environmental Problems*

1. Problems related to interaction with the legal system/crime.
2. Problems related to the social environment.
3. Occupational problem.

Axis V. *Global Assessment of Functioning*

1. GAF = 5 (highest level during year preceding his final arrest).
2. GAF = 5 (at the time of his arrest).

view human objects as more dehumanized and consequently may increase the likelihood of violence toward strangers. JD only killed people that he did not know well.

The role of sexualized fantasies appears to be important in JD's development as a serial killer because from an early age he was already internally preoccupied with bodies and body parts and later with their sexual nature, a finding that is consistent with previous investigators who think that pervasive fantasy formation has a decisive role with sexual crimes by both adult and adolescent perpetrators (57–60). The advantage of the AD paradigm lies in that it provides a better explanation regarding the origin of sexual fantasy as an antecedent in serial killing behavior, namely that intrinsically

AD tends to promote isolation, resulting in a relative inability to test fantasy formation against the backdrop of the surrounding social world. This pervasive mental isolation may place some AD adolescents at significant risk for developing idiosyncratic and violent fantasies that, unchecked by external social controls, can lead to homicidal ideas and actions. The violent behaviors and other antisocial activities displayed by children with features of AD appear to be more closely related to their fantasy life than to adverse environmental circumstances (14,61).

The identification of AD as a decisive factor in the genesis of sexual serial homicide in the JD case may well represent a psychiatrically, criminologically, and biologically relevant paradigm of substantial heuristic and practical value because it may provide a unifying explanation of sexual serial killing behaviors that integrate neuropsychiatric, behavioral, and developmental levels of organization for at least a subset of sexual serial killers. Arguably, the foremost advantage of the proposed pervasive developmental disorder paradigm for serial sexual killing behavior is that it may provide a central insight into the specific psychological causes for serial killing in association with specific underlying neurobiological events. In contrast, most typologies for the causation of serial killing behavior strongly rely on sexual motives as well as a need by the perpetrator to control the victims. Egger addresses this issue when he states, "It may simply be (as the author is beginning to believe) that the serial killer's search to gain control over his or her own life by violence and sex and to control and dominate others is the central and causal factor in the development of the serial killer" (27, p. 8). Our current model explicitly and directly deals with this problem by postulating that a fundamental reason for sexual serial killing behavior involves conceptualizing the perpetrators as a complex function of physical and psychological parameters. However, central to our proposal is the fact that this information can be

gin and must be integrated at the neurobiological level, and that the perpetrator's behavior is an expression of a relentless, repetitive, and intense factors both of a sexual and non-sexual nature, which ultimately represent a failed search at controlling other human beings and the environment. In the rest of this article, we explore the most important aspects of this proposal.

### *Theory of Mind Deficits in Asperger's Disorder*

In 1978, primatologists Premack and Woodruff introduced the term "theory of mind" to refer to the ability to realistically assess the mental states of conspecifics as well as other species (62). The idea that human beings must successfully negotiate a realistic understanding of the intentions of their conspecifics as well as other creatures, is consistent with evolutionary theory, because sexually successful individuals must be able to assess the thoughts, intentions, and emotions not only of themselves, but also of potential mates and predators in order to maximize the chances of their genomic propagation (63,64). Since the publication of Premack and Woodruff's seminal article, various researchers have uncovered substantial evidence indicating that the ability to estimate other people's mental states or "mind reading" (65), as it has come to be known, is a universal human capacity. Mind reading can be more accurately viewed as the ability to estimate the mental life of others given previous experience and present social ecological contexts. Theory of Mind (ToM) capacities are likely to be under strict ontogenic control, and they become evident in young children by four years of age (66). Furthermore, Baron-Cohen and his colleagues as well as many other investigators have studied mind reading abilities in autistic children and discovered that many of them suffer from various types and degrees of ToM deficits. This abnormality has come to be known as "mindblindness" (65). ToM deficits appear to be present in schizophrenia and other forms of psychosis, although the degree of disability appears to be less than that encountered in severe autism (67).

ToM abilities have also begun to be studied in children who suffer from AD, and preliminary information indicates that in contradistinction to children with autism, AD subjects score within normal limits in tests designed to measure these abilities (20,66). However, both clinical specialists and researchers in AD as well as family members of AD persons and AD individuals themselves consistently report that those with AD have noteworthy difficulties in assessing the mental states of others and understanding the social world around them. These deficits appear to be closely associated with intrinsic limitations in assessing the cognitive and the affective states of others as well as with an associated dearth of empathy (16,68–78). This information is also consistent with the notion that available tests for detecting theory of mind deficits may be limited by an emphasis placed on measuring cognitive rather than affective factors in spite of the likelihood that ToM abilities evolved to assess the cognitive as well as the affective life of other creatures. Moreover, construction of ToM tests that take into account autistic functioning in naturalistic or "real life" settings is only in the early states of development (79).

### **Neurobiological Perspectives**

Arguably the most important advantage of the pervasive developmental disorder model of serial killing behavior is that it naturally leads to conceptualization of at least a subset of serial killing behavior as bounded by a limited set of neurobiological characteristics subsumed under a specific pathologic process. In this regard, there are several impressive lines of evidence that persuasively sug-

gest that AD is a neuropsychiatric disorder associated with genetic, neurobiological, and neuropsychologic abnormalities (20,21,80–82). Although the nature of familial and possibly genetic influences in AD remains to be fully clarified (83,84), the available knowledge in this area is consistent with the view that genetic factors may be implicated in AD and other pervasive developmental disorders. The preliminary but mounting evidence suggests that these disorders tend to occur in close relatives of affected individuals (85–87). Asperger himself made the initial observation that AD tended to occur in fathers of affected AD patients (32,47). Since that time, an association of AD with males has been fairly consistently documented (85,86). The case of JD and his father provides an excellent example involving similar phenotypic characteristics within the autistic spectrum disorders linking a son-father dyad (23,85).

The neuropsychiatry of pervasive developmental disorders including AD is only beginning to be studied (79). Structural neuroimaging studies report several alterations in autistic spectrum disorders including the amygdala, cerebellum, hippocampus, and corpus callosum (81). Recent neuroimaging studies indicate increased cerebellar mass in high-functioning autistic subjects versus controls matched for normal IQ (88). Other studies also report increased size of cerebellar structures in autistic spectrum disorders (89). Furthermore, neuroanatomical abnormalities in the amygdala and hippocampus of autistic spectrum individuals have recently been documented (90). The reported morphometric changes are not indicative of well-localized neuroanatomic abnormalities. Rather, they suggest relatively widespread developmental neural network abnormalities. These results, together with abnormal histologic findings including increased cell packing of the limbic system, abnormal dendritic development, and decreased number of Purkinje cells (91–93) suggest the development of abnormal neuronal cytoarchitecture associated with abnormal growth, elimination, and pruning of both the cerebellum and cerebral cortex.

Haznedar and colleagues, using positron emission topography (PET) imaging, revealed that individuals suffering with AD had decreased glucose metabolism in the anterior and posterior cingulate gyri relative to healthy controls (94). Autistic disorder individuals also show decreased metabolism at Area 24 and 24' in the anterior cingulate gyrus (95). These results are consistent with the role that the cingulate gyrus is thought to have in mood processing and regulation (96) and the well-known receptive and expressive mood abnormalities phenotypically intrinsic to autism (8). Several studies report executive function deficits in AD, suggesting that AD subjects suffer from abnormalities in flexibility necessary to shift from one response set to another (97–99). Moreover, the ability to construct representations of mental states of the self and of others is thought to involve the representational abilities of the prefrontal cortex (100). Therefore, at least some of the difficulties in assessing the mental states of other people, deficits in social reciprocal interactions and empathy in AD, may be associated with frontal lobe dysfunction. Other central nervous system substrates are likely to be involved in autistic spectrum psychopathology. For example, in some cases AD has been associated with unilateral and bilateral cortical atrophy (101) and right cerebral hemisphere dysfunction (102). However, the significance of these findings remains to be clarified.

### *Aggressive Behavior Associated with Asperger's Disorder*

Several psychiatric and developmental factors may be related to the origin of aggression in JD's case, of which AD may arguably be the most important. Across the life span, significant violent be-

havior has not been frequently observed among those with AD. However, an association between aggression and AD does not appear to be uncommon during childhood. Often, aggression appears to be due to the frustration associated with low tolerance in AD children for environmental change (103), but has also been observed in affected individuals who have impairments in their ability to interpret nonverbal cues (68). Several cases of AD associated with aggression have also been reported in some detail in the psychiatric literature. Scragg and Shah studied the prevalence of AD in males in Broadmoor Hospital, one of England's secure hospitals, and concluded that the disorder had a prevalence in the range of 1.5 to 2.3% compared to a prevalence of 0.5% in the general population. All six patients with AD were violent, assumed physically threatening stances, and/or made threats to injure. Furthermore, they hypothesized that lack of empathy and obsessional interests may be related to violence in people with AD (104). However, their conclusion regarding serious aggression in AD has been questioned on methodological grounds (105). According to Ghaziuddin and colleagues, a review of case studies of AD in the psychiatric literature did not support an association between AD and violence (106). Wolff also conducted a study whose profiles conform closely to AD and found that girls but not boys were more likely than controls to engage in antisocial behaviors including various forms of aggression. Although boys with characteristics of AD were as likely as controls to engage in antisocial behaviors, the former group was less likely to have experienced risk factors for antisocial behavior secondary to ecological rather than organismal factors (14). Clarification regarding the association between AD and aggression will require appropriate epidemiologic prevalence studies.

Beyond whether AD in general is statistically significantly associated with violent behavior, it is possible that specific subtypes of AD may have an increased risk for violence. Therefore, an analysis of AD cases available in the psychiatric literature may provide a clue regarding a possible association between AD and violence. Baron-Cohen described the case of a 21-year-old man with AD who had been involved in numerous physical attacks toward others. The patient's father had noted that the patient tended to become aggressive while concerned with the shape of his jaw, which objectively appeared normal. He also was at risk of violence as a result of social contacts and changes of routine. He tended to violently break inanimate objects. He was aggressive toward his brothers and once had to be forcibly removed from his brother because he had attempted to strangle him. Apparently this occurred due to the patient's frustration and inability to correctly place batteries in a tape recorder. The patient was also hospitalized in a psychiatric hospital following 20 physical attacks toward his girlfriend in the preceding day. He had been hitting her about two to three times daily on a regular basis. He stated that he would slap her face because he was preoccupied and bitter about his jaw and because she was vulnerable and weak and it made him feel powerful. He was described as having little understanding of other people's emotions (107).

Some cases of AD may be associated not only with non-sexualized aggression but also with formal sexual psychopathology, such as compulsive masturbation, fetishistic sexuality potentially resulting in illicit sexual behavior (66,108–110). Fetishistic sexuality may be the outgrowth of the tendency for AD individuals to engage in repetitive, ritualized, restricted, and intense interests, tension reducing in nature and established after the onset of puberty during adolescence. Mawson and his colleagues reported the case of a 44-year-old male with AD, who physically attacked women, girls, and

infants. He was also reported to have sexually idiosyncratic thoughts (111). Cooper and colleagues described the case of a 38-year-old male heterosexual transvestite with AD and a history of having been "charged with assaulting the daughter of a neighbor, which was followed in 1988 with two charges of assault and one charge of indecent assault on women" (108, p. 192). He had also been engaged in episodes with women unfamiliar to him that he had encountered in the street during which he touched their breasts or buttocks (108, 1993). Kohn and his colleagues reported the case of a 16-year-old male who had physically assaulted others on several occasions. At age 14, he had been involved in three sexual assaults. During one of the assaults, he had grabbed, attempted to undress, and touched the breasts and genitals of a girl (109). Cases of autistic-spectrum disorders involving sexual psychopathology without violent behavior have also been described (110).

The origins of sexual psychopathology in autistic spectrum disorders may be due to a dearth of opportunity to learn socially adaptive sexuality available to affected individuals. It may also be that specific autistic characteristics directly lead to the development of less socialized, more pathologically aggressive forms of sexual behavior (110). In the case of JD, both pathways were synergistically involved in the development of his malignant sexual psychopathology.

#### *The Origins of Aggression in the Case of Jeffrey Dahmer: The Pursuit of Object Constancy and Order*

Although individuals who suffer from AD may pursue activities that promote order in primitive and bizarre ways, their tendency to adopt approaches with a predilection for physically oriented order can be remarkably adaptive in a society that values specialization of skills, training for which requires intense and sustained focus and a need for a high degree of organization. Therefore, in the United States and in other highly technically developed countries, it is thought that many individuals with AD characteristics tend to gravitate to areas such as engineering, computer science, and other scientific fields where their overriding concerns involving physical order and replicability may be well rewarded (55,112). Several studies involving specific accomplished individuals in the above-mentioned fields suggest that they suffered from AD or similar high-functioning autistic spectrum disorders (14,16,72). People with AD may also be especially drawn to activities involving collecting physical and inanimate objects. Some of these may involve traditional hobbies such as collecting stamps or rocks or repairing radios. Often, however, they engage in more unusual, primitive, bizarre, or aggressive pursuits such as collecting the names of the passengers of the ill-fated ocean liner Titanic, ecclesiastical activities, or less frequently, atypical violence. These interests underlie a fundamental problem often found in AD, namely that many of these patients are limited in their educational adaptation because of their relative inability to adjust to basic learning modalities inherent in the school system and their difficulties in emotional reciprocity (113). In JD's case, these problems were manifested in his pervasive difficulties in school coupled with his obsessive-like interests with collecting deceased insects as well as other animals, followed by a morbid preoccupation with animal anatomy and later the architecture of human bodies. JD's initial fascination with insect collecting and animal bodies during childhood appears to have been non-sexual. From his socially isolated worldview, his eventual interest in human bodies as sexual objects necessitated that he would become a collector of cadavers and human body parts (28).

The sexualization of JD's "Asperger's objects" insured that JD would pursue control not of the only physical but also of the sexual dimension. It is possible that initially JD could have satisfied his necrophilic drives by collecting cadavers as necrophile Edward Gein often did earlier in the twentieth century (114). This impression is consistent with JD's consistent report of attempting to obtain the cadaver of a recently deceased young man who had revived some sexual desires in JD (17). However, the fact that JD did not achieve sufficient sexual satisfaction with a mannequin and continued to kill others in spite of amassing a substantial collection of body parts, suggests that he was at best only partially able to achieve sexual satisfaction with nonliving human objects. Individuals with AD tend to exhibit not only a need to seek physical order but commonly display an obsessive-like relentless quality in their pursuit of their restricted and inflexible interests associated with mechanistic order (17). In JD's case, the fact that his sexual objects were initially alive and impregnated with their own freedom required that JD would exert control by causing unconsciousness (via sedation), "zombie-like" states, (via crude attempts at chemical-surgical "lobotomies") or death. However, in contrast to some serial killers (115), it would appear that for JD the control and ultimate destruction of the human object was not its sole end but also a means to construct his own social-physical universe. JD was not a sadist. As writer Brian Masters stated, JD's dynamic indicated, "He did not enjoy the killing, but had to kill in order to love" (17, p. 95). From a developmental perspective, JD's Asperger's objects evolved from control and exploration of animal bodies and their components (26) to control and exploration of his victims as "sexualized objects."

JD viewed male bodies not only as potential objects to promote order and constancy in his life but also as avenues for sexual satisfaction, as evidenced by his relentless need to control, kill, dismember, and then engage in necrophilic sexuality. From JD's highly distorted perspective, he needed to institute overwhelming control of the sexualized object. A challenging problem for an individual who develops an overriding interest in collecting human bodies is that, while alive, human bodies harbor their intrinsic intentionality. Therefore, JD viewed living human sexual objects as fundamentally problematic, because they were endowed with their own freedom and their consequent capacity to abandon him. His solution was consistent with a mentalizing deficit that began with his lifelong substantial cognitive and affective difficulties in judging the thoughts and feelings of others. He tended to experience others as he experienced his Asperger's type of self. In other words, he displayed a relative but profound inability to assess the mental life of others, and this in turn led him to project his impoverished understanding of his own mental life on others. He viewed his sexual objects largely as physical receptacles for the fulfillment of his own sexual desires and misread their minds as obstacles for the construction of his social world. Therefore, his overriding interest in controlling and preserving sexually desirable objects led to his first solution, namely rendering his sexual contacts unconscious as first seen in the use of sedatives during his contacts in the gay bathhouses (3,17). A second and more effective solution necessitated that his sexual contacts be killed because that allowed for total freedom of both bodily and sexual manipulation. From his perspective, the boundary between living sexuality and necrophilia became blurred. But the later "living state" became preferable because JD remained in total control. His third solution involved attempts to turn his lovers into mindless bodies or "zombies." But, in fact, his theory of mind deficit meant that ideally only his will and by inference his mind should control and "inhabit" their bodies. Techni-

cally, he tried to achieve this state by his failed attempts at "lobotomies." At its worst, JD's difficulties in assessing other persons not only involved a blurring of mental boundaries but also bodily boundaries, echoing Tantam's view that individuals with AD "do not make the sharp distinction between people and things that is normally expected. Objects may have animistic power, and people may be measured like objects" (68, 2000, p. 383). JD's necrophilic activities, his mystical concerns about building a shrine made of human parts, as well as his pleasurable necrophagia can be viewed from this perspective. Understandably, this situation led him to conclude that necrophagia involved "just the feeling of making him part of me" (116, p. 123), and to keep trophies or souvenirs of his victims "to a point far beyond that reached by other killers" (116, p. 12). Finally, JD arrived at a fourth solution, and this requires an understanding of the meaning that he ascribed to the stored body parts and photographs that he took of the dismembering process. Essentially, the dissected body parts served as a dynamic array of transitional sexual objects, harbingers of a state of mind in the twilight of JD's perverse relationship with his previous existential and/or sexual involvements involving a full formerly alive sex object and a resulting cadaver or bodily parts impregnated with the possibility for existential and/or sexual reenactment. In this final solution, JD envisioned a temple or shrine endowed with a distorted sense of aesthetics and religious meaning inherent in a symmetry demarcated by body parts that can only come alive by honoring JD's own mental states (17). Therefore, by taking into account his highly idiosyncratic viewpoint, JD's killings must be viewed as perverse acts of existential creation. In summary, JD's pathological pursuit of order substantially explains the traditional view that he was interested in exerting total control of others (116). However, it is important to emphasize that JD's sexual serial homicides are entirely in keeping with the obsessive and restrictive pre-occupations typical of AD and other autistic spectrum states (6,8,45).

Jeffrey Dahmer also represents an example of people who suffer from AD and, in the context of their psychologically isolative states, a behavioral trait that predisposes them to ignore cues from their physical and social world around them, predisposing them to remain unaffected by the modifying effects of social influences (117). More than normal people, people with AD are left at the mercy of their internal mental life, including their intrinsic predispositions for violence. Whether or not there is a significant link between aggression and AD in general remains to be elucidated. However, to the extent that aggression in AD exists, it may be related less to the microenvironment of the family and social disadvantages presumably associated with broad social factors than constitutional psychodynamic factors. Likewise, aggression in AD may be more closely related to an unusual fantasy life, which in turn appears to be linked to the internal generation of cognitive and affective processes inherent in individual mental architecture. In essence, aggressive behaviors associated with AD appear to be less explainable via environmental factors (14,61), a situation that is consistent with JD's life history.

#### *Asperger's Syndrome and Personality Psychopathology Interactions*

Although the relationship between AD and schizoid personality disorder remains a topic of debate (14,32,118-121), several studies have compared AD to schizoid personality disorder, and some have concluded that, while schizoid personality disorder and AD are phenomenologically similar, they can be differentiated because the for-

mer does not have reciprocal social interaction abnormalities, has no restrictive, repetitive stereotypical patterns of behavior, and overall appear healthier (121). Nonetheless, childhood AD and childhood schizoid personality disorder share striking similarities (121), consistent with the idea that childhood schizoid personality disorder and milder forms of pervasive developmental disorder spectrum such as AD are closely related, leading Wolff to recommend the term schizoid/Asperger disorder when referring to individuals suffering from these pathologies (14). Given these considerations, it is perhaps not surprising that JD exhibited a large number of traits for both AD and schizoid personality disorder. Our analysis of JD's personality traits would qualify him for lacking of desire for emotionally close relationships, taking little pleasure in multiple interests, lacking close friends or confidants, showing emotional detachment and flattened affectivity, and often remaining untouched by the criticism and praise of others. In fact, JD did not qualify for DSM-IV-TR schizoid personality disorder diagnosis only because a diagnosis of AD precludes a diagnosis of schizoid personality disorder. JD also presented with some longstanding metaphysical preoccupations involving magical thinking that date to his adolescence suggestive of some schizotypal personality disorder psychopathology. Based on these considerations alone, JD would qualify for a personality disorder not otherwise specified with schizoid and schizotypal traits (6). Schizoid personality disorder in adulthood also has been associated with a higher history of violent crimes (122). Furthermore, there is high co-morbidity between serial killing behavior and schizoid personality disorder features (123). The clear implication of this information is that a close association between schizoid personality disorder traits and serial killing behavior may also be indicative of a close linkage between AD and at least a subgroup of serial killers, and that the case of JD illustrates this association in a dramatic and convincing fashion.

Although AD may be implicated with aggression, including violent behaviors during childhood and early adolescence (68,103,111), it is still important to emphasize that AD associated with adult criminal violence is infrequently documented. One explanation could be that adult AD is not significantly associated with aggressive behaviors. However, these findings may be also be due to the fact that AD has not been traditionally conceptualized as an important explicative concept for aggression, therefore discouraging diagnosticians from considering AD. Alternatively, other factors may be implicated in the genesis of serial killing behavior associated with AD, and those factors, especially psychopathy, may conceptually obscure the role of AD in their associated violence. Regardless of the precise nature of the link between AD and psychopathy, in JD's case, a significant component of psychopathy remains an important consideration in understanding the origin of his violent behavior. Although JD was not available to us via direct interview, our review of extensive psychiatric, social, and criminological information, including videotaped interview information with him by others, allowed us to perform an in-depth analysis of his level of psychopathy via the Hare's Psychopathy Checklist (124). JD's score of 22 in the Psychopathy Checklist indicates a significant level of psychopathy, though this is not likely to qualify him as a psychopath. This impression is also consistent with the work of other diagnosticians who have acknowledged JD's antisocial behaviors, but who overall reached a robust consensus among them that JD did not suffer from a full antisocial personality disorder (18). However, due to his substantial schizoid personality disorder features, his psychopathic traits, and schizotypal pathology, he would qualify for a diagnosis of personality disorder not otherwise specified with schizoid, antisocial, and schizotypal personal-

ity disorder traits. Nonetheless, establishing that JD suffered from a substantial level of psychopathy is important because a high level of psychopathy as well as antisocial personality disorder pathology are well-established risk factors for engaging in future violence (125–127). JD's substantial degree of psychopathy raises the intriguing possibility that, for at least a subtype of serial killers, a tightly linked behavioral system involving independent but complementary contributions from AD and psychopathy in the genesis of violence may at least in part explain the origins of sexual serial killing behavior. However, it is important to note that AD and psychopathy appear to share some affective features in common, such as lack of empathy and shallow affect (6), raising the possibility that they may have some neurobiological substrates in common. Moreover, they also have other subtle psychological features in common. An alternative mode of interactions for an AD-psychopathy behavioral system may involve various biopsychological features that are additive, while others are complementary in their contribution toward a final pathway for generating characteristic forms of violence in one or more subgroups.

#### *Mood Psychopathology and Alcohol as Facilitating Factors for Serial Killing Behavior*

Alcohol use and its association with violence has been reported in many studies (128–131). Also, it is widely acknowledged that JD had a longstanding problem with alcoholism (3,17,23). A more challenging question revolves around the role that alcohol may have had in facilitating JD's sexual serial killing behavior. However, alcohol use and its relation to violence in AD have not been systematically studied. However, in JD's case, killing and dismembering per se may not have had as special appeal to him as is widely and popularly assumed. This is especially true if we take into account JD's consistent statements that he did not engage in the torture of others (116). This impression is consistent with the finding that a formal diagnosis of sexual sadism was not made by most of those who evaluated him (17,18). It appears that JD consistently used alcohol as a means to garner sufficient mental resources to carry out homicide and dismembering, activities that he found relatively unpleasant (17,29). Thus, JD's alcohol used during his homicidal activities should be viewed as a facilitating agent rather than a cause of his murderous behavior. The view that alcohol and other drugs are not intrinsic causes of serial killing behavior is a view widely shared by forensic behavioral specialists (116). However, empirical support for the exact role of substance abuse in serial killing behavior is still fairly limited.

JD also complained of depressive symptoms, and these were especially well documented during the year prior to his final arrest (26). These included chronic low self-esteem, depressive thoughts, feelings of depression, hopelessness, and suicidal ideation (17,26). Because the role of chronic alcohol use in the origin of his mood difficulties cannot be fully clarified, JD's mood abnormalities are consistent with diagnostic criteria for depressive disorder not otherwise specified, in accordance with DSM-IV-TR (6). Recent evidence suggests that depressive illness may be a potential cause of violence (132,133). In JD's case, his depressive symptoms and compulsivity appeared to increase his risk for becoming homicidal. JD became particularly dysphoric when he simultaneously experienced loneliness, feelings of rejection, and loss of control of his personal environment. At least temporarily, his mood appeared to improve with the availability of unconditionally receptive sexual objects in the form of unconscious men, cadavers, or their partially deconstructed bodies or body parts. In JD's case, his depressive ill-

ness may have involved a genetic component linked to JD's mother, who appears to have suffered from significant depression at least since JD was an infant (3,17,27).

#### *Role of Environmental Stressors in Dahmer's Serial Killing Behavior*

The expression of aggression is usually the product of the interplay between the mental life of the individual and the environment. Environmental stress has been proposed as an important factor in the origin of serial killers, a view that is supported by the lives of many serial killers, since many experienced multiple serious stressors such as poverty, childhood physical and sexual abuse, and upbringing in unstable or broken families (12). However, since most people who experience these types of stressors do not become serial killers, most investigators believe that stress can only partially account for their homicidal behaviors. More likely, multi-factorial causation involving psychological, social, and biological factors is at work. In JD's case, his psychopathology likely worsened during late adolescence when his parent's marriage became further destabilized, culminating in divorce. This situation might have been particularly devastating for JD, whose psychopathology involved a tendency to decompensate when the physical and social order of his life was further compromised by his mother, apparently leaving without making adequate arrangements for his care at the time when JD was age 18 (17,23,25).

#### *Suggestions for Further Research*

The present study reframes JD as an example of an important type of serial killer, based on a specific form of autistic spectrum psychopathology. This hypothesis must be tested by analyzing large numbers of cases of serial killers in detail and by developing a large dataset of serial killing behavior and autistic spectrum-related information in order to explore the extent and nature of relevant pervasive developmental psychopathology among these killers. The relation of AD and related psychopathology and psychopathy to serial killing behavior may be further explored through several lines. These include the following:

1. *Pursuit of careful phenomenological studies to delineate the relationship between autistic spectrum symptoms and psychopathy in criminal offenders with and without violence and/or sexual psychopathology.* The development of semi-structured interview instruments as well as self-rating instruments for diagnosing autistic spectrum conditions or for exploring the phenomenological structure of these conditions should facilitate the forensic psychiatric study of autistic spectrum disorders (110,134,135). The range of pervasive developmental psychopathology that lies between AD and normality should be a particularly important ground to study, since serial killing behavior requires many cognitive abilities and the ability to estimate other people's intentions to remain relatively intact. The possibility that a specific subtype of pervasive developmental disorder associated with serial killing behavior exists should be intensely explored. The relation between the phenomenology of AD and other high-functioning autistic spectrum behaviors should be systematically compared to already developed serial-killing typologies such as those developed by the Federal Bureau of Investigation and other investigators (136).
2. *The systematic and integrated study of inner mental experiences in AD, psychopathic individuals, serial killers, paraphilics, and other relevant groups.* This approach may shed light on the way that serial killers such as JD can develop. The study of inner experiences appears to be a difficult but viable endeavor in a wide range of mental disorders (137).
3. Theory of Mind abilities and potentially related abilities such as gaze processing and executive functioning and related paradigms such as facial recognition, identity recognition, and social and evolutionary correlates of brain architectures (138–141) are approaches that seek to understand potential deficits in understanding the mental life of others. This may be one of the great benefits of conceptualizing some serial killing behavior as an autistic spectrum disorder.
4. The fact that autism and its variants are the object of intense study from various neuroscientific perspectives raises the distinct possibility that some forms of serial killing behavior may prove more amenable to study from the vantage point of a scientific paradigm that encompasses neurobiological, psychological, and social categories of organization. In particular, new work on the neuroanatomy of serial killers (142) and psychopathy (143) should be systematically compared to already more extensive brain neuroanatomical information obtained from the different subtypes of autistic spectrum disorders (89,90,94,95, 144).
5. The application of the proposed model may also have applicability to other forms of serial crimes such as certain types of serial rape behavior (145) as well as certain types of terroristic behaviors suggestive of autistic spectrum psychopathology (146,147).

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