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Risk and dynamics of violence in Asperger's syndrome: A systematic review of the literature☆

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ABSTRACT

The main purpose of this article is to delineate findings from a review of the literature on the empirical basis for the existence of a relationship between Asperger's syndrome (AS) and violence risk. A second aim is to examine whether certain characteristics of the disorder may have a higher violence-triggering potential. Results of this review show that there are very few empirical studies that confirm a stable link between AS and violence. Only 11 studies involving 22 patients and 29 violent incidents met the criteria for inclusion in the review after the search of the literature. However, a qualitative analysis of the studies yielded some indications of possible patterns of dynamics of violence that may prove to be typical of persons with AS. A tentative comparison of AS and psychopathy indicated that there may be qualitative differences in the characteristics of violent behavior between the disorders. Suggestions for further research are presented.

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The earliest attempts to diagnose autism and, later on, a broader group of related developmental disabilities designated *autism spectrum disorder* recorded in the international literature date back to Kanner (1943). In 1944, Hans Asperger described a syndrome that has subsequently been given his name, even though clinical descriptions matching this disorder had already been published in European literature in the 1920s (Frith, 1991). Asperger believed the syndrome was caused by genetic factors or brain damage and labelled it *autistic psychopathy*. He argued that it shared some characteristics with, but still was different from, Kanner's early childhood autism. According to Asperger, persons with autistic psychopathy had a stable personality disorder marked by social isolation, but were not as withdrawn or aloof as Kanner's patients. Even though these individuals' intellectual skills were intact, they engaged in little nonverbal communication involving gestures and affective tone of voice, and had poor empathy and a tendency to intellectualize emotions. Asperger also emphasized their inclination to engage in long-lasting, one-sided, sometimes incoherent, and rather formalistic speech. They were also physically clumsy, and dominating and all-absorbing interests involving unusual topics dominated their conversation.

Asperger's work, however, was largely ignored until an article by Wing (1981) revitalized interest in this diagnostic concept. Still, it was not introduced in the ICD and DSM diagnostic systems as a separate diagnostic concept until the early 90s (APA, 1995; WHO, 1992). The introduction of Asperger's syndrome (AS) in the ICD-10 and DSM-IV was prompted by the recognition that autism is a clinically heterogeneous disorder and that the characterization of subtypes might help clinicians and researchers by allowing the identification of clinically more homogenous diagnostic subtypes such as AS. However, the DSM-IV criteria for AS, in particular, have been heavily criticized, and it is also asserted that efforts to develop assessment scales to evaluate AS have not been successful (e.g., Campbell, 2005; Klin & Volkmar, 2003). One main issue has been whether the AS should be considered as a part of a dimensional continuum together with other pervasive developmental disorders (PDD) or if there actually are qualitative discontinuities among the PDDs. This issue falls outside the main purpose of the current review, and the reader is referred to other literature for further study (e.g., Cashin, 2006; Klin & Volkmar, 2003; Matson, 2007).

1. Some clinical features associated with Asperger's syndrome

Despite some differences in diagnostic criteria, sustained impairments in social interaction and restricted repetitive patterns of behavior are common criteria in the DSM and ICD systems. Paradoxically, even if AS is a neurodevelopmental disturbance already present in early childhood, most of its clinical expressions and the significant impairment it causes tend not to be manifested until late puberty and early adulthood. It has been suggested that this may explain the relatively late diagnosis found in many cases of AS (Katz et al., 2006). Because this period of life is characterized by higher social demands, and marked importance of adaptive social functioning, the consequences of any impairment of this kind may be grave.

According to Wing (1996), a diagnosis of AS should be based on a detailed assessment of the individual's developmental history and present behavior. She particularly emphasized a triad of impairments: impairments in social interaction, communication, and imagination. Individuals with AS display a wide spectrum of behavioral responses, and it is not unlikely that a substantial proportion of their conduct problems is triggered by actual and/or perceived failure in their social interactions.

In contrast to autism, onset criteria state that there should be no clinically significant delay in language acquisition or cognitive and self-help skills. Although individuals with AS generally do not suffer from speech abnormalities, some communication deviances are often present: a constricted range of, and often inappropriate, intonation patterns, an unusual rate of speech, tangential and circumstantial speech, and incessant talk about a subject without regard for others' lack of interest in it. Although individuals with AS find themselves socially isolated, they are not usually withdrawn in the presence of other people. They may want friendships, but their wishes are thwarted by their own eccentric, awkward approaches and insensitivity to other people's feelings, intentions, and communications. Typically, they may be able to cognitively describe other people's emotions and intentions, but they are unable to act on this information in an intuitive and spontaneous way (Baron-Cohen, 2000). Their dependence on rule-governed behavior creates a social rigidity and immaturity that is so typical of these individuals. Acquisition of motor skills is typically delayed, and they often appear visibly awkward, with bouncy gait patterns, poor coordination, and odd posture.

2. Asperger's syndrome and violence

In a review of the literature, Fombonne and Tidmarsh (2003) found only one epidemiologic study that investigated AS alone and six studies that provided specific estimates for the prevalence of the disorder, together with estimates of other subtypes of pervasive developmental disorders. The prevalence rates reported in these studies ranged from 0.3 to 48.4 per 10,000. The authors concluded that the reviewed studies were flawed by methodological problems, and that further research was needed to obtain more valid estimates. Murphy (2003) reported that there is some evidence that 3 to 4 in every 1000 children may develop the full syndrome and that, although this issue is far from settled, there is general agreement that the prevalence of AS is low. Given the low prevalence of AS, it is not clear how commonly violent behavior occurs. Attempts to assess the violence rate have been hampered by problems pertaining to reliable and valid diagnoses of Asperger's syndrome and accurate recordings of violence. These two factors, along with the relatively recent increase in interest in the syndrome, probably explain, in part, the highly divergent estimates that have been presented so far. Table 1.

In a retrospective case study, Scragg and Shah (1994) suggested a possible association between AS and violence in 1.5% of a highly selected population of mentally abnormal offenders in England. The addition of equivocal cases increased the prevalence to 2.3%. A study of forensic patients in Sweden found that 4% of 135 youngsters who committed assault fit the Asperger's syndrome diagnosis (Siponmaa, Kristiansson, Jonson, Nydèn, & Gillberg, 2001). Ghaziuddin, Tsai, and Ghaziuddin (1991) estimated a violence prevalence rate of 2.7% in the AS population, whereas Kohn, Fahum, Ratzoni, and Apter (1998) found a prevalence of aggression around 20% (Ghaziuddin et al., 1991; Kohn et al., 1998). The divergent estimates obtained from these studies calls for a systematic review to obtain a more exact prevalence

Table 1
Characteristics of violence toward others in persons with Asperger's syndrome.

Study	Sample			Motive	Violence characteristics		Victim
	Nationality	n[a]	Age[b]		Trigger	Type[c]	
Mawson et al., (1985)	England	1	44	Jealousy	Female car driver	Attack with screwdriver	Woman
				Sensory hypersensitivity	Female dressing	Physical assault	Woman
				Sensory hypersensitivity	Dog's barking	Attack with screwdriver	Dog and girl
				Sensory hypersensitivity	Child's crying	Physical assault	Child
Baron-Cohen (1988)	England	1	21	Worrying about his jaw	Not getting the "right" response to his worry	Physical assault	71 year old girlfriend
Chesterman and Rutter (1993)	England	1	22	Misinterpretation[d]	Asked about burglary	Physical assault	Police officer
Scragg and Shah (1994)	England	4	–[e]	–	–	Physical threat	–
			–	–	–	Physical assault	–
			–	–	–	Homicide	–
			–	–	–	Homicidal threats	–
Kohn et al. (1998)	Israel	1	16	Sexual	Girl in the street	Attempted rape	Unknown girl
				–	–	Physical assault	Old man
				–	–	Physical assault	Young boy
				Misinterpretation	Fear of police	Physical assault	Mother
				–	–	Physical assault	A youth and an instructor
Bankier et al. (1999)	Austria	1	25	–	–	Physical assault	Mother
Raja and Azzoni (2001)	Italy	1	33	Paranoid ideation	Claiming parents were not his real parents	Threats with a knife	Parents
Murrie et al. (2002)	England	3	31	Revenge	"Negative" house details	Arson[f]	Unknown people
			44	Fear of losing custody	Custodial evaluation	Homicide attempt	Psychologist
			31	Sexual fantasy	Available victims	Threats with a knife	Two unknown women
Barry-Walsh and Mullen (2004)	Australia and New Zealand	3	–	Tactile hypersensitivity	Physical assistance	Physical assault	Unknown persons
			24	Self-protection	Verbal confrontation	Physical assault	Father
			16	Sexual advance	Available victim	Physical assault	Unknown girl
Schwartz-Watts (2005)	USA	3	22	Tactile hypersensitivity	Foot ran over by victim	Homicide	8-year old boy
			35	Tactile hypersensitivity	Victim hit his face	Homicide	Male neighbour
			20	Misinterpretation	Victim approached him	Homicide	Father of girlfriend
Katz et al. (2006)	Israel	3	30	Feeling offended	Limit-setting	Physical assault	Mother
			22	Misinterpretation	Felt that he was treated in an improper way	Physical assault	Sister and father
			38	Threat against O–C[g] behaviour	Disruption of routines	Physical assault	Wife

[a] Number of patients accepted from each study.
[b] Age at assessment after violent incident.
[c] The most severe act of violence is described if there were more than one type of violent behavior in the actual incident.
[d] The patient misinterpreted the communication and social interaction of the situation.
[e] No information found in the article.
[f] With the intention to cause physical injury or death on another individual.
[g] Obssessive–compulsive.

rate of violence in individuals with AS. Moreover, it is unclear whether the studies referred to above actually can be taken as evidence of a true and specific association between AS and violence.

Even if such a prevalence association is found, we would still need to find out more specifically whether there are particular features of AS that make some individuals with the syndrome more prone to violent behavior than others. Several case studies document some unusual examples of violence committed by an occasional AS patient (e.g., Everall & Lecoteur, 1990; Hollander, Dolgoff-Kaspar, Cartwright, Rawitt, & Novotny, 2001; Milton, Duggan, Latham, Egan, & Tantam, 2002). However, some of these studies used very broad definitions of violence that included agitation, non-violent anger, damage to property, and the like. Furthermore, there are few articles that have compiled case studies in order to do a systematic search for common elements of dynamics of violence specific to this disorder. This implies that we currently lack knowledge about any particular characteristics of dynamics of violence specific to these persons. What, for example, appears to motivate violent behavior in people with Aspberger? Are there certain triggers or precipitants of violence? What type of violent behavior is to be expected? Who would the victims tend to be?

2.1. Asperger's syndrome and psychopathy: different disorders but similar dynamics of violence?

A link between anti-social behavior and AS has been noted by many authors (Everall & Lecoteur, 1990; Mawson, Grounds, & Tantam, 1985; Simblett & Wilson, 1993). However, in a small sample of patients with AS in a high security forensic hospital, all of the patients were found to have PCL-R total scores below North American and British cut-off figures for psychopathy (Murphy, 2007). The highest scores were found for some of the affective components such as lack of remorse or guilt, shallow affect, and callousness/lack of empathy. Some of the case studies reported in the literature depict persons with AS who have committed serious violent offenses in response to minor provocations and without any remorse afterwards (e.g., Schwartz-Watts, 2005). Empathic failure in relation to violent behavior is reported to be a hallmark of anti-social and psychopathic personality disorder. According to Blair (2005), autism and psychopathy are the two main psychiatric disorders associated with emphatic dysfunction. Based on the suggested link between persons with Asperger's syndrome and psychopathy, it is of interest here to scrutinize possible similarities and differences concerning violence in the two disorders.

In summary, although findings from some studies indicate a possible link between AS and violence, the need for a systematic review of the literature to examine this possibility seems clear. The main objectives of this review, therefore, are (a) to examine the empirical basis for the existence of a relationship between Asperger's syndrome and violence risk, (b) to determine whether certain characteristics of Asperger's syndrome may have a higher violence-triggering potential, and (c) to compare possible characteristics of violence in persons with Asperger's syndrome with those found in persons with psychopathy.

3. Method

3.1. Data collection

Two searches were conducted on the possible relationship between Asperger's syndrome and violence in the anglophonic literature. Studies were obtained through electronic data searches on CINAHL (1982 to medio February 2007), Cochrane Reviews (1992 to medio February 2007), Medline (1966 to medio February 2007), ProQuest (1992 to medio February 2007), PsycInfo (1967 to medio February 2007), and ScienceDirect (1995 to medio February 2007). The search terms for the first search were *review of* and *Asperger's syndrome* and *risk assessment* or *risk management* and *violence risk* or *violence* or *violent behavior* or *aggression* or *aggressive behavior* and *psychiatric patients* or *psychotic patients* or *psychosis* or *forensic patients* or *personality disorders*. Apart from not including *review of*, the search terms for the second search were identical to the first. Hand searches were conducted in the reference lists of all relevant papers for additional studies.

3.2. Assessment criteria

3.2.1. Inclusion criteria for study type

Studies were considered for inclusion if they provided qualitative or quantitative data on the relationship between AS and violence and had been published as full papers or research notes in peer-reviewed journals. In accordance with previous recommendations on conducting systematic reviews, studies were excluded if they only had been published as abstracts or conference proceedings (e.g., Knipschild, 1995; Lloyd Jones, 2004). Research investigating violence only in persons with AS or providing separate information of violent individuals with this disorder as part of larger studies was accepted for analysis.

3.2.2. Inclusion criteria for diagnosis

Only studies describing patients who met the ICD-10 criteria for AS and DSM-IV criteria for Asperger's disorder, except the one related to completely normal development in the first three years of life, were included. Research that did not explicitly indicate that either the ICD-10 or the DSM-IV had been used was also entered for analysis if application of the same AS criteria was documented in the paper.

Studies that reported on samples with different diagnoses were only included if measures and parameters for individuals with AS were presented separately.

3.2.3. Inclusion criteria for violence

The review is primarily limited *to empirical studies* of the relationship between Asperger's syndrome and violence *toward another individual*. *Violence* is defined as intentional attempts at, threats of, or actual and intended infliction of bodily injury or harm on another person. The basis of the criteria used in this definition is taken from the MacArthur Violence Risk Assessment Study (Monahan & Appelbaum, 2000):

- physical assaults leading to physical injury in another person.
- the use of a dangerous object/weapon against another person.
- threats about using a weapon against another person.
- the use of physical force in connection with sexual offenses.

The review also includes physical and verbal threats that clearly imply an imminent physical assault. Damage to property and harm to self are not accepted as violence, and fire-setting is only included if it was done with the intent to cause bodily harm to other people.

3.3. Sifting retrieved citations

Sifting was carried out in three stages as recommended in the literature (e.g., Lloyd Jones, 2004). Papers were first reviewed by title, then by abstract, and, finally, by full text. Those that at each step did not meet the inclusion criteria were excluded, resulting in 11 papers after hand searches (see Fig. 1).

4. Results

4.1. Is there an empirical basis for the existence of a relationship between Asperger's syndrome and violence risk?

Of the 11 studies, only 5 accentuated the link between AS and violence as an explicit research aim in the title, the abstract, and the introduction. England was the country of origin for five studies and Israel, for two. The remaining four studies came from Austria, USA, Australia/New Zealand, and Italy. The oldest article was published in 1985, and the most recent, in 2006.

4.1.1. Design and sample

Six of the studies were carried out in forensic settings and five were from general psychiatric facilities. Eight case studies ($n = 14$ patients with AS and violence) and three prevalence studies ($n = 8$) were found. The patients were all male, and the mean age for the 17 patients for whom this information was presented was 27.9 years (*range* = 16–44 years).

4.1.2. Operational delineation and measurement of violence

Instruments specially developed to record aggression and violence were not used in any of the 11 studies. The operational descriptions of the actual violent episodes varied from the somehow limited format of case study narratives (e.g., Schwartz-Watts, 2005) to a detailed and interview-based assessment of violence (Baron-Cohen, 1988). The latter study included detailed information of dynamic aspects such as frequency, antecedents, and feelings before, during, and after the violent act.

4.2. Do certain characteristics of Asperger's syndrome have a higher violence-triggering potential?

A total of 29 violent incidents were found and analyzed pertaining to motives, triggers, types, and victims of violence.

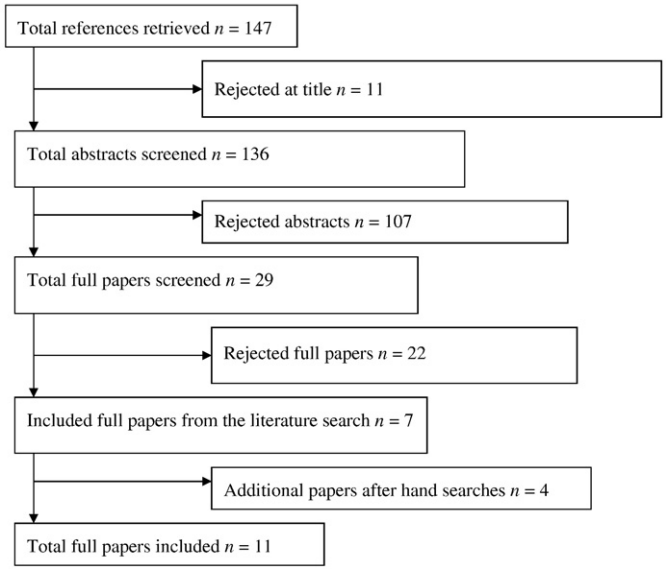

Fig. 1. Summary of study selection and exclusion based on electronic literature searches and hand searches.

4.2.1. Motives of violence

Ten (35%) of the violent acts were motivated by communicative and social misinterpretations of other persons' intentions. The most frequent reason for misinterpretations was the Asperger individual's failure to interpret the valence of the context of the affective interaction. Some of the Asperger persons appeared to be insensitive to other people's emotions and the intentions they expressed, others attributed negative intentions to generally non-provocative communication and behavior from other people.

Sensory hypersensitivity was the second largest cause of violent behavior (6 incidents, 21%). In one case, a young boy was killed after running over the patient's foot with his bicycle (Katz et al., 2006). Another patient explained his violent behavior by claiming that he felt compelled to physically stop a child crying and a dog barking because of his hypersensitivity to high-pitched sounds (Mawson et al., 1985). In the two violent acts, the common motivational denominator appears to be violence as a means of alleviating sensory strain. Three episodes (10%) were motivated by a combination of sexual frustration and emphatic failure to acknowledge and respect other people's integrity. Finally, in two episodes (7%), other persons' disruption of Asperger individuals' preoccupations, such as hoarding large amounts of newspapers, instigated the violent act. In eight (28%) of the incidents, no motive was presented.

4.2.2. Triggers of violence

Visual appearance was reported as a final trigger in six (21%) episodes. One patient explained an attempt to stab a girl by her being indecently dressed, and another one, who was responsible for 11 cases of arson, related being triggered by similarities in small details of the houses that reminded him of the houses of peers who had harassed him in school.

Another category of triggers pertains to "not getting the right response or being approached in a wrong manner by others" ($n=5$ acts, 17%). Baron-Cohen (1988) provides a good illustration of this by describing a man who hit his girlfriend because she answered him in "a deep tone of voice". Ordinary, non-provocative physical nearness ($n=3$, 10%) and limit-setting ($n=3$, 10%) were also presented as possible precipitants of violence in some case studies ($n=3$, 10%). Finally, only one incident (3%) was triggered by paranoid ideation and worries about child custody, respectively. In eight (28%) of the violent acts, no information of immediate precursors of violence was provided.

4.2.3. Type of violence

Twenty-three of the 29 violent acts were physical assaults, including four homicides, one attempted rape, and one case of spree arson. Six physical threats were reported, two of which were threats with a knife in hand. Although some angry violent incidents were reported, the violence was generally carried out in an emotionally detached manner.

4.2.4. Victims of violence

Fourteen females and 12 males were targets of violence. In three cases, the sex of the victim was not specified. The violence was mainly directed against strangers ($n=17$, 59%), but occurred in close relationships as well ($n=10$, 35%). Parents were the targets on seven occasions (24%). In four cases, no information concerning the victim was provided. Five patients assaulted more than one person in the same violent episode.

4.3. Do persons with Asperger's syndrome share characteristics of violence with persons with psychopathy?

Based on research on violence in psychopathy and preliminary findings of the present review concerning persons with AS, the following characteristics were used for comparison: (a) sensory reactivity, (b) interpersonal communication, (c) typical violence, (d) reinforcement of aggression, and (e) responsibility for violence (Table 2). Findings from these comparisons indicated that there may be substantial differences between the two diagnostic disorders regarding these five criteria.

Table 2
Possible differences between characteristics of violence in Asperger's syndrome and psychopathy.

Characteristic	Psychopathy	Asperger's Syndrome
Sensory reactivity	Hypo	Hyper
Interpersonal communication	Manipulative	Naïve
Typical violence	Proactive	Reactive
Reinforcement contingency	Positive	Negative
Relating to violence	Denial	Confession

5. Discussion

5.1. Main findings

The main finding of this review was that despite anecdotal reports of increased violence risk in people with AS, little systematic research about its frequency and character has been published. That being the case, the review suggests that (a) there is no empirical evidence to support a claim that there is a link between Asperger's syndrome and violence, and, at the same time, (b) because of the paucity of studies on this issue, there is no evidence to preclude the claim that there is an increased risk of violence in persons with AS. In spite of the increased research interest in the disorder, it is somehow surprising that this finding concurs with Hall and Bernall's (1995) critique of the empirical evidence for an Asperger's syndrome–violence link.

The second and third purpose of this investigation depended on a positive identification of a link between Asperger's syndrome and increased risk of violence in the reviewed literature. Since this relationship not was confirmed by empirical findings, one has to be very cautious in further elaboration on possible characteristics that may distinguish the violence in persons with AS from that of other diagnostic groups. Accordingly, this part of the discussion must be regarded as an attempt to form a basis for further hypothesis generation. Understood in this context, the results of the review suggest that although (a) violence perpetrated by persons with Asperger's syndrome generally appears to be similar to that of persons with other mental disorders, the findings also indicate that (b) violence by people with AS may prove to be motivated by factors specific to the disorder. The discussion will be organized around the following topics: Diagnostic issues, empathy deficiency, impairment in social interaction, and comparison with psychopathy.

5.1.1. Diagnostic issues

As noted, the nosological status of Asperger's syndrome remains unclear. According to Klin and Volkmar (2003), the absence of a consensual validated definition has not discouraged a steadily growing number of research publications on the syndrome nor a substantial increase in the clinical use of the diagnosis. One of the main issues being debated about this syndrome is whether or not there are qualitative discontinuities along the pervasive developmental disorder continuum and whether persons with AS actually are high-functioning individuals on this dimensional continuum or not. Although the issues this debate raises lie outside the scope of the review, it is important to bear in mind that these are issues that may have a bearing on the results of this review, given the strict diagnostic definition of AS that was used.

Beyond that, however, it appears more relevant to the review to search for a deeper clinical understanding of special characteristics and dynamics of the violence scrutinized in the review, than to search for confirmation of the external validity of the AS diagnosis. From the perspective of the potential victim, the patient, or the mental health professional, the most important aim is, after all, to prevent violent incidents by improving efficient risk assessment, treatment, and

management strategies. The reader is referred to other sources for further studies concerning the diagnostic issue (e.g., Campbell, 2005; Klin & Volkmar, 2003; Matson, 2007).

5.1.2. Empathy deficiency

The last couple of decades have seen support growing for a three-point division of empathy. For instance, Blair (2005, p. 699) argues that "the term 'empathy' subsumes a variety of dissociable neurocognitive processes. Three main divisions, each reliant on at least partially dissociable neural systems, will be identified: cognitive, motor, and emotional empathy." *Cognitive empathy* refers to the theory of mind concept; *motor empathy* occurs when the individual mirrors the motor responses of the observed actor; and *emotional empathy* covers adequate emotional responses to the emotions of others. A great majority of the perpetrators analyzed in the review seemed genuinely unaware of the physical and psychological pain they had inflicted on their victims. However, this appeared not to be due to a lack of cognitive empathy, but rather to an impaired ability to apply this knowledge to everyday interactions with others. Most of the persons with AS in the reviewed studies were fully able to describe the negative consequences for the victims of their violent behavior, but failed to feel any compassion for them. It is suggested here that this empathic impairment is of an emotional nature. Simply said, this deficit appears to be more closely linked to the capacity to be involved emotionally than to report in a detached manner on others' emotional responses (Batson, Fultz, & Schoenrade, 1987). Still, there were no indications of pleasure or sadistic elements in the violence described. The reward was mainly connected to relief from sensory irritation and frustration. No information was obtained concerning motor empathy, but it is worthwhile to note that individuals with autism spectrum disorders have been found to be clearly impaired with respect to motor empathy (e.g., Blair, 2005).

5.1.3. Impairment in social interaction

Murrie, Warren, Kristiansson & Dietz (2002) reported that the most consistent evidence of the impact of social impairments in social interaction was related to deficient empathy (Murrie et al., 2002). Katz et al. (2006) claim that a primary reason for violence in persons with AS is their inability to perceive other people's needs, desires, or stress. This is further complicated by their impaired ability to interpret correctly other people's behavior.

In the reviewed studies, there were indications of two main categories of impairment in social interaction that precipitated violence. The first and most prominent category covers misinterpretations and coping failure in initiating and entering social interactions. In these cases, social interaction was initiated by the individuals with AS ("self-initiated" main category). They approached and sought contact, not out of frustration over another's appearance or behavior, but because of a desire for a social relationship. In some instances of this type, individuals misinterpreted the victims as being cold and non-responding because the victims did not respond as they wanted; in others, they approached people in a fear-inducing manner that they perceived to be appropriate at the time. Their knowing that "making people fearful is wrong" did not seem to affect their actions. All were surprised by the reactions their behavior evoked in others.

In contrast to the first type, the second main category of interaction is reactive and characterized by frustration triggered by the appearance and behavior of other people ("reactive" main category). As with the first main category, interpersonal naiveté and impoverished understanding of human relationships apparently increased frustration and risk of violence. However, in the second main category, this was combined with a marked hypersensitivity to sensory stimuli from other people. Some may easily misperceive this combination as a type of paranoia. However, Blackshaw, Kinderman Hare, & Hatton (2001) suggest that people with AS suffer from a private self-consciousness, as opposed to the public self-consciousness found in paranoid disorders (Blackshaw et al., 2001). In support of this view, the reviewed studies reported few cases involving perpetrators who had experienced delusions about people plotting against them and fear of being physically injured or killed. Instead, these individuals appeared to suffer from preoccupations connected to sensory stimuli and a very strong determination to stop the source of frustration causing the pain. In fact, if their frustration had been caused by sounds from an air conditioner, the air conditioner would have become the target of the aggressive behavior – in the same way that human beings were when their noise or appearances triggered high levels of frustration. The main motive was to shut down the source of frustration, and there appeared to be no systematized delusional superstructure that governed this process.

5.1.4. Comparison with psychopathy

As the empathy issue has been discussed above, this section is devoted to comparing AS and psychopathy across other, but possibly related, variables relevant to risk for violence (Table 2). First, there appear to be some similarities between the two disorders concerning reduced ability to make cognitive and behavioral changes. This has been demonstrated in studies of impaired aversive conditioning (e.g., Flor, Birbaumer, Hermann, Ziegler & Patrick, 2002), passive avoidance learning (Blair, 2006), and response reversal (Mitchell, Colledge, Leonard & Blair, 2002). However, there is so far no conclusive empirical evidence of a link between these impairments and risk of violence. The extreme difference in sensory reactivity may be illustrated by violence motivated by boredom in a psychopath versus an attack on a child by a person with AS because of the unbearable sound of the crying child. Even as a determined manipulative style is one of the prominent features of psychopathy, the socially ignorant naïve style of interpersonal communication is typical of AS. However, both response styles may lead to frustration and subsequent violence.

Psychopaths are known to have excessive displays of instrumental or proactive violence that are governed by planned and goal-directed search for positive reinforcement. In contrast to this, although people with AS are not incapable of instrumental violence, they mainly appear to be triggered through a three-step process consisting of reactive or affective violence and a negative reinforcement contingency. To give an example: First, the person wants to enter a social relationship with somebody, but due to his social naivité and misinterpretations, he does so in a provocative manner. Second, he is rebuffed, and this frustrates him. Finally, his impaired social problem-solving ability enhances the likelihood of violence as a relief from the frustrating interaction. This detached type of violence, however, appears to be qualitatively different from the callous instrumental violence found in psychopaths. When confronted with their violence, the predominant response from psychopaths is denial. This position is sustained at least until there is something gained by admitting the misdeed. In the review, people with AS confessed their violent acts immediately; the offending behavior, however, was not recognized as being truly wrong, and their actions were not modified by the easily recognisable adverse consequences for the victim. In sum, although this comparison is of a preliminary nature and must be interpreted with caution, specific characteristics of violence in persons with AS seem to differ markedly from those of psychopaths.

5.2. Review limitations

Some cautions apply to interpreting the results the review. First, there are considerable limitations of even the best electronic search, and the findings of this review must be interpreted accordingly. Second, the strict operational criteria used resulted in the exclusion of some cases and some studies because they did not specify the operational criteria for concepts such as violence and aggression. Third, due to the low number of studies and cases involved, the discussion of the qualitative findings must be interpreted within a hypothesis-generating framework. Finally, there is always the possibility that there is a discrepancy between what is actually done and observed in clinical practice and how this is reflected in the literature.

5.3. Conclusion and suggestions for future research

The assumed presence of an AS-violence link was not supported by the findings of this review. However, systematic research on this association is scarce, and the strength and specific nature of the relationship remain unclear. The preliminary qualitative analysis indicated that there may be characteristics of violence that are specific to the AS disorder and that these characteristics make it different from violence typical of psychopaths. It is recommended that future studies should address two main issues. First, the prevalence estimates of the syndrome and, more specifically, the size of a possible violent subgroup must become more accurate. Second, possible violence-prone aspects of the disorder should be systematically identified. This might be done by examining the following:

1. Determining ways violent and non-violent persons with this disorder differ. It will be essential that research on this topic attend to confounding variables (see Hiday, 2006, for a review). If a large proportion of violent persons with AS also have other characteristics that may cause violence, the explanatory impact of these variables should be controlled for in multivariate analyses. Variables such as substance misuse, psychopathy/antisocial personality disorder, victimization, and living in a disorganized community may act as confounding variables in the assessment of a possible AS-violence link.
2. The time frame involved in the relationship between the course of the illness and violence risk. Asperger's syndrome is a pervasive developmental disorder, but little is known of whether fluctuations in risk of violence pertain to different phases of the disorder.
3. Whether violence by persons with AS relate to any experience, interpersonal relationship, particular symptoms, deviant behavior, or the disorder as a whole.
4. Individual dynamic aspects that may enhance violence, such as lack of recognition of stress-vulnerability interactions that may trigger violence, insufficient awareness of warning signs of violent behavior, and so forth.

It is suggested that in order to answer these and related questions, future studies should (a) be prospective in nature, (b) include more accurate measurement and analysis of the relative contribution of different characteristics of AS, (c) have a special focus on the dynamics of aggression within an interactional and situational perspective, (d) present differentiated measures and analysis pertaining to different severities of violence, and (e) investigate a possible link between AS and different forms of aggression, such as psychological, physical and sexual violence.

In summary, at this stage, the evidence does not allow for firm conclusions concerning the association between Asperger's syndrome and risk for violence. Irrespective of how large the proportion of violent persons with AS is, however, it is essential to persons suffering from the disorder and their potential victims that the quality of risk assessment, management, and treatment is improved. Clinical research is one of the key means to this end.

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