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**A systematic review of people with Autism Spectrum
Disorder and the Criminal Justice System.**

Claire King

and

Glynis H. Murphy*

Tizard Centre, University of Kent,

Canterbury, Kent CT2 7LR

*** corresponding author: g.h.murphy@kent.ac.uk**

Key words: autism, ASD, ASC, Asperger syndrome, crime, offending, Criminal Justice

Abstract

This paper provides a systemic review of the available literature on people with autism spectrum disorder (ASD) in the criminal justice system (CJS). The review considers two main types of study: those that examined the prevalence of people with ASD in the CJS and those where the prevalence of offending is examined in populations with ASD. In addition, types of offences in people with ASD, co-morbid psychiatric diagnoses, and characteristics of people with ASD who commit offences (including predisposing factors) are considered. A combination of search terms was used in a variety of databases in order to find all of the available literature on this topic, and research studies were included based on specified inclusion and exclusion criteria. It was found that whilst there is an emerging literature on this topic, there are a wide variety of methodologies used, making direct comparison between studies difficult. Nevertheless it can be concluded so far that people with ASD do not seem to be disproportionately over-represented in the CJS, though they commit a range of crimes and seem to have a number of predisposing features. There is poor evidence of the presence of comorbid psychiatric diagnoses (except in mental health settings) amongst offenders with ASD, and little evidence of the oft-asserted over-representation of certain kinds of crimes. It is recommended that further research of good quality is required in this area, rather than studies that examine populations that are not representative of all those with ASD.

Introduction

Autism and Asperger Syndrome have been recognised as clinical entities since the 1940s, but they have only entered the standardised psychiatric diagnostic classification schemes more recently. Nowadays, both are recognised as part of a spectrum of conditions, referred to in the recently published DSM-5 (2013) as ‘Autism Spectrum Disorder’ (ASD), a group of pervasive developmental disorders characterised by impairments in social communication, social interaction and social imagination, which were suggested by Wing (1966) to be the ‘triad of impairments’ (Wing 1996). The prevalence of ASD is now generally regarded to be approximately 1 in 100 (Baird, Simonoff, Pickles, Chandler, Loucas, Meldrum & Charman, 2006 and Brugha, McManus, Meltzer, Smith, Scott, Purdon, Harris & Bankart, 2007) in Western countries.

It is not unusual for people with ASD to show challenging behaviours, and often these may become chronic (Murphy, Beadle-Brown, Wing, Gould, Shah & Holmes, 2005) and require highly specialist interventions. At times, these behaviours put people at risk of entering the Criminal Justice System (CJS), especially if they are relatively able individuals (most jurisdictions do not allow people with very low abilities to enter the CJS, on the grounds that they are likely to lack *mens rea*, may be unfit to plead and may not know right from wrong). In the research literature, a series of case studies of people with ASD (describing between one and six individuals in each case) have appeared that describe the kinds of crimes and circumstances that may arise for people with ASD in the CJS (Baron-Cohen, 1988; Barry-Walsh & Mullen, 2004; Chen, Chen, Yang, Yeh, Chen & Lo, 2003; Cooper, Mohamed & Collacott, 1993; Everall & Le Couteur, 1990; Fujikawa, Umeshita & Mutura, 2002; Haskins & Silva, 2006; Mawson, Grounds & Tantum, 1985; Murrie, Warren & Kristiansson 2002; Radley & Shaherbano, 2011; Schwartz-Watts, 2005; Toichi, 2002). There are also some well known cases of individuals with ASD who engaged in offending behaviours that have drawn widespread media attention (such as the case of Gary McKinnon in the UK who hacked into US government computers looking for evidence of UFOs, apparently causing over \$800,000 worth of damage; and see also Kumagami & Matsuura, 2009 for three examples from Japan). In addition, there are reports in some follow-up studies of people with ASD, of behaviour leading to the involvement of the police (Cederlund, Hag-

berg, Billstedt, Gillberg & Gillberg, 2008). So the question often asked is: are people with ASD at raised risk of engaging in illegal behaviours?

In some ways, it could be argued that they may be at low risk, since many people with ASD find rules helpful in surviving in the social world, and laws are simply social rules of a particular type. On the other hand, Howlin (2004, p. 302) proposed four factors that might make people with autism more likely to carry out aggressive or law-breaking acts:

- Their increased social naiveté may leave people with an ASD open to manipulation by others
- A disruption of routines, or over-rigid adherence to rules, might lead people with an ASD to becoming aggressive
- A lack of understanding of social situations (and poor negotiating skills) might lead to people with an ASD becoming aggressive
- An obsessional interest might lead someone to committing an offence in the pursuit of that interest, perhaps exacerbated by a failure to recognise the implications of his/her behaviour for him/herself and others (as could be argued in the case of Gary McKinnon).

Wing (1981) also proposed that low levels of empathy in people with an ASD may contribute to the likelihood of an offence (though this is usually interpreted now as a deficit in theory of mind), and similarly Lerner, Haque, Northrup, Lawer & Bursztajn (2012) suggested impaired theory of mind, poor emotional regulation, and problems with moral reasoning may raise the risk of an offence. Meanwhile, Newman & Ghaziuddin (2008) in reviewing a series of single-case, and small-scale studies of people with ASD and violent offending, concluded that psychiatric co-morbidity (which they argued was present in most of these cases), was a major contributory factor to their offending. Furthermore, as Mayes (2003) and Freckelton (2012; 2013) have argued, some of the characteristics of people with ASD almost certainly impact on a person's fitness to plead, culpability, criminal responsibility, and ability to survive custodial disposals, yet not all courts are sympathetic to expert witnesses' views about their ASD client's special difficulties.

The relatively new status of autism/ASD as a diagnostic entity (not appearing in DSM until the 1980s) is likely to have impacted on the amount of research specifically focusing on people with ASD who commit criminal offences. In contrast, there has been considerable

research on offending and intellectual disabilities (ID) and, given that many people with ASD also have ID, it may be useful therefore to explore previous research that has focused on people with ID and offending behaviour. In any case, ID is characterised by impairments in cognitive, language and social abilities and so it could be hypothesised that people with ID would have some of the same difficulties as people with ASD. Existing research on people with ID and the CJS has focused on three main areas: prevalence of offending behaviour in people with ID, prevalence of ID in offender populations; and vulnerabilities of people with ID in the CJS.

It is often said that previous research has found higher rates of offending behaviour within populations of people with ID, compared to non-disabled populations, but actually this finding is not robust, and the better the methodology of the study, the more the effect disappears. Birth cohort studies (eg Hodgins, 1992 and Hodgins, Mednick, Brennan, Scgulinger & Endberg, 1996) and other cohort studies (eg McBrien, Hodgetts and Gregory, 2003) reported high rates of conviction for people with ID, but such studies have a biased sample of people with ID, in that the samples were determined administratively. Other research in ID has examined how many people with ID there are in various parts of the CJS. Some parts have reported higher percentages than the 2% that would be expected (eg about 5-9% of suspects in police stations have ID according to Gudjonsson, Clare, Rutter & Pearse, 1993 and Lyall, Holland, Collins & Styles, 1995), while rates are lower than expected in other places when carefully measured (eg. in prisons, see Fazel, Xenitidis & Powell, 2008). Rates also seem to vary across jurisdictions, no doubt at least partly because the possibilities for diversion out of the CJS vary across jurisdictions (see Murphy and Mason, in press, for a discussion of this). What does seem to be overwhelmingly important in offending (in people with and without ID) is high levels of social deprivation, so that offenders with and without ID in prisons turn out to be very similar in terms of social and legal characteristics (MacEachron, 1979), i.e. they are often unemployed and unmarried, and poorly educated. Dickson, Emerson and Hatton (2005) also found that adolescents with ID were no more likely to have offended than other adolescents, once poverty and social deprivation were taken into account. Moreover it appears that people with ID are more vulnerable in the CJS because they may not understand their rights, are more suggestible and acquiescent, are more likely to falsely confess and are more likely to make poor decisions once in the CJS, if they do not have good advice, than are the general population (Clare & Gudjonsson, 1993; Clare & Gudjonsson, 1995; Gudjonsson 1992; Perske, 2011).

Protections built into the CJS for people with ID are not always effective, as very often it is difficult for CJS staff (like lawyers or policemen) to know when someone has an ID (Bean & Nemitz, 1994; Medford, Gudjonsson & Pearse, 2000; Talbot 2008). The ability of people with ID to understand the complex language and terminology used in the CJS is also thought to be problematic, with some people not even understanding the difference between the words ‘guilty’ and ‘not guilty’ or having the meanings of these words reversed (Smith, 1993). Given that people with ASD have difficulties with social rules and also have difficulty with communication (though rather different deficits from people with ID), and given that many people with ASD also have ID, it seems likely that those with ASD may well have some similar difficulties to people with ID within the CJS.

Nevertheless, in comparison to the research on people with ID in the CJS, there are very few studies of people with ASD. In recent years in the UK, there have been several policy-based publications focused specifically on Autism, such as ‘Fulfilling and Rewarding Lives, the strategy for adults with autism’ (Department of Health, 2010) and ‘Autism, a guide for criminal justice professionals’ (National Autistic Society, 2011) that make reference to people with autism in the CJS. However, in order to plan services for people with ASD who offend, and to prevent people with ASD from offending where possible, it is important to understand how prevalent offending is in this population, the types of offences people may commit and whether there are any co-existing factors that might relate to offending behaviour. The few published reviews that have appeared (e.g. Cashin and Newman 2009, Gomez de la Cuesta 2010, Mourisden, 2012), have been selective descriptive reviews, rather than systematic reviews. They have reported some evidence of higher rates of autism within offender populations, but they noted that most of the available research had been carried out in forensic hospital settings. They have also reported that, when examining populations of people with ASD, there was great variability of evidence regarding rates of offending, with some evidence of the relevance of other mental health needs, and very little research on the experience of people with ASD themselves in the CJS. The current review planned to use the areas highlighted in previous research as a guide to the likely important themes when carrying out a systematic review of the available literature.

Method

Search Strategy

A search of professional databases was undertaken using the following keywords as search terms:

Autism keywords.

- Autis*
- ASD
- ASC
- Asperger
- Pervasive Developmental Disorder

Criminal Justice System keywords.

- Criminal Justice System
- Prison
- Probation
- Court
- Secure
- Forensic
- Crim*
- Offen*

Each of the autism keywords was searched alongside each of the CJS keywords. No date restrictions were placed on the search and the databases searched were PsycINFO, MEDLINE, Cochrane Database of Systematic Reviews and Criminal Justice Abstracts. The initial search was undertaken in April 2011, repeated in January 2012 and in January 2013, and a hand search of the most recent issue of journals that printed two or more articles that met the inclusion criteria was also carried out. The National Autistic Society internet database of research published about autism spectrum disorder was also searched using all of the CJS keywords. Finally the reference lists of the articles selected were scrutinised for further publications of relevance (see Figure 1).

Inclusion and Exclusion Criteria

The title and abstract of each of the articles identified through the database search was reviewed to ensure that they met the following inclusion criteria:

- English-language
- Peer reviewed journal
- Participants with a diagnosis of an autism spectrum disorder according to either ICD-10 or DSM-IV-TR criteria
- Participants had some involvement in the CJS, by way of contact with the police, courts, prison service, probation or secure hospitals.

Articles were excluded if:

- They only reported 'autistic symptoms', using a questionnaire, with no attempt at diagnosis/interviews
- They were concerned with witnesses with ASD in the CJS, not suspects or offenders
- They were single case studies
- They were dissertations
- They focused on treatment
- They were reviews

Each of the articles that appeared to meet the inclusion criteria was reviewed in full to assess the quality of the study. One paper (Soderstrom, 2005) was subsequently excluded as it appeared to contain the same data in relation to the topic of this review, as were published in a previous study (which has been included) by the same author (Soderstrom, Sjodin, Carlstedt & Forman, 2004). Another paper was excluded on the grounds that it measured only symptoms of ASD and treated these as a continuum, rather than considering those diagnosed with ASD (Hart-Kerkhoffs, Jansen, Doreleijers, Vermeiren, Minderaa & Hartman, 2009), and a third paper was excluded because, although it examined vulnerabilities of people with ASD in interrogative interviews, the participants were not actually involved in the CJS (Maras & Bowler, 2012). These three excluded papers do not appear in the Tables of resulting papers; they are considered in the Discussion section where relevant.

Information collected from research / data analysis

The research papers identified were analysed with a focus on the following issues:

- Within offender populations, the prevalence rates of ASD
- Within populations of people with ASD, the prevalence rates of offending behaviour
- Types of offence committed by people with ASD
- Psychiatric co-morbidity in people with ASD who offend
- Vulnerabilities and other characteristics of people with ASD within the CJS

Due to the variety of methodologies used and focus of research in this area it was not possible to complete a meta-analysis of the data collected. Instead descriptive data were produced and tabulated for each of the areas listed. Figure 1 shows the flow chart for articles, including the numbers found at each stage, and the final number.

Figure 1 about here

Results

Prevalence of ASD in offender populations

Ideally, studies of the prevalence of ASD amongst arrestees or offenders, should entail unbiased samples (either total population samples or random samples) of the section of the CJS under study (for example, of those arrested as suspects; of those appearing in court; of those convicted). Identification of people with ASD in the sample should entail ASD screening, followed by developmental interview (such as the Autism Diagnostic Interview, ADI) or a similar robust procedure. In fact, as Table 1 shows, only two of the studies came close to this level of perfection in terms of collecting unbiased samples (studies 3 & 4), but neither had good methodology for ASD diagnosis.

Of the seven studies in Table 1, three were from Sweden, three from UK and one from Japan. Almost all of them (studies 1, 2, 5, 6, 7) involved examining rates of ASD amongst people referred for forensic psychiatric evaluation (i.e. people in the CJS who were already thought to have some kind of mental health issues - studies 1, 6, 7) or amongst people already hospitalised in a forensic mental health facility (studies 2 & 5). Only two reported prevalence of ASD in an unbiased sample (study 3 & 4): one (study 3) of these involved a series of 335 cases appearing before the juvenile courts in Japan, while the other (study 4) involved the total populations of 12 prisons in Scotland. As regards measures of ASC, four studies employed screening instruments (studies 2, 4, 5, 7) followed by file audit or interview, four employed full psychiatric evaluations (studies 1, 5, 6, & 7, with some of these also including in-patient stays) and one involved file review and interviews only (study 3). Three involved at least some developmental interviews with family members (studies 4, 6 & 7).

Table 1 about here

It can be seen from Table 1 that the prevalence rate of ASD found in all of these studies was higher than the 1% prevalence rate found in the general population, suggesting that ASD is more prevalent in those people who offend. However, the prevalence rates reported showed a great deal of variation (from 3% or less in study 1, 2 and 5, to up to 27% for PDD in study 6). Most of this variation is likely to reflect the methodology used and the type or source of the sample (for example, forensic psychiatry samples often produce high

prevalence rates, as those referred are highly likely to have mental health needs of some description). It is difficult to make direct comparisons between the studies, as there is a lack of consistency in the measures employed and in the terminologies used to describe autism spectrum conditions, with some studies using ‘autism’ and ‘Asperger’ (e.g. study 1, 2 & 5), others using ‘pervasive developmental disorder’ (study 3) and others classifying all parts of the spectrum.

Prevalence of offending behaviour in people with ASD

Much as unbiased samples were required from parts of the CJS for the previous section (on prevalence of ASD in the CJS), this section requires unbiased samples of people with ASD, preferably all diagnosed using robust developmental interviews (such as the ADI), in order to consider prevalence of offending behaviour. For example, a good study would have a consecutive series of people within a defined geographical area, where the clinic in question did all the diagnostic work for the local area and kept a complete register of all those diagnosed. Good studies would also have an unbiased comparison sample so as to be able to conclude whether or not people with ASD were at more or less risk than the rest of the population for offending. The six studies shown in Table 2 came from UK (2), USA (2), Denmark (1) and Austria (1), and only two used geographically based total registers of people (studies 9 & 10 from USA). The others attempted to obtain full samples from particular areas and periods of time (eg part of Wales in study 8; Hans Asperger’s clinic sample in study 11; in-patient referrals in study 12; community sample in study 13). Most studies (9, 10, 11, 12, 13) had some kind of comparison group, though this was not always well-matched to the ASD group.

Table 2 about here

It can be seen from Table 2 that the prevalence figures for offending behaviour in people with ASD, reported by the six studies varied a great deal, with rates for people with Asperger syndrome varying from 2.74% to 26%, and even up to 48% for self-reported crime (in study 12). All of the studies that did use a comparison group of some kind (studies 9, 10, 11, 12, 13) found rates of offending behaviour in the ASD group that were the same or lower than in the comparison groups without ASD. One study also examined prevalence rates according to the classifications of ASD (Mouridsen, Rich, Isager & Nedergaard, 2008) and found higher rates of offending in participants with Asperger syndrome, than

those with childhood autism and atypical autism. A complicating factor in interpreting the results of these studies is the varying way in which studies counted 'offending'. Some studies logged only convictions and tended to get lower rates (e.g. study 11), whereas others counted contacts with justice departments (e.g. studies 9 & 10), getting middling rates, and yet others counted self-report of criminal activities (e.g. study 13) and these obtained the highest 'offending' rates.

Types of offence committed by people with ASD

In relation to types of offence, in order to be able to conclude with confidence that people with ASD are more or less likely to commit particular types of offences, studies need to have unbiased samples of people with ASD and of people without ASD. Yet, as can be seen in Table 3, out of the seven studies, only two studies (studies 3 & 10) achieved this standard. Cheely, Carpenter, Letourneau, Nicholas, Charles & King (study 10) found young people with ASD, when they did commit offences (as judged by contact with the justice department), significantly more often committed crimes against people and significantly less often committed property offences, than young people without ASD. They also were significantly more often involved in school disturbances and significantly less often in probation violations than young people without ASD. The two groups did not differ significantly on other offence types (eg. public order offences, drug crimes). Kumagami & Matsuura (study 3) found offenders with PDD engaged in mostly similar types of crime to non-ASD offenders, though property crime rates were lower, and sexual crime rates were higher, than for non-ASD offenders.

Only two other studies in Table 3 used comparison groups of people without ASD (studies 12 & 13), although they did not have unbiased ASD samples. They showed relatively few differences in types of offences between the ASD offenders and the non-ASD offenders, though there seemed to be a somewhat a lower rate of driving offences (study 12) and drug offences (study 13) among the ASD groups. Only one controlled study reported a significantly increased rate of arson in one sub-sample (study 12), while others reported no differences in rates of arson compared to control groups (eg study 3). Enyati et al (2008), study 1, also reported a raised rate of arson compared to other offences in his Asperger

group, but their rate of arson offences was no different from that in his comparison group with no mental health diagnoses.

Table 3 about here

Other studies in Table 3 neither had unbiased ASD samples, nor did they use non-ASD control groups. Therefore, although they show some startling figures, such as high rates of violent conduct, threatening behaviour and/or arson (studies 2, 8 & 14), these effects are almost certainly due to the source of the samples (e.g. forensic referrals and/or hospitalised samples) rather than true differences between people with ASD and people without.

Co-morbid psychiatric diagnosis

Studies that reported on the co-morbid psychiatric diagnoses for people with ASD who had offended (see Table 4), all employed samples who were either already in a mental health hospital (studies 2 & 15) or who had been referred for forensic assessment (study 16). It was therefore perhaps not surprising that there was a general trend of high rates of co-morbid psychiatric diagnosis, particularly of psychosis and personality disorder, since these were clearly very biased samples. There were considerable differences in the methodologies used to make the psychiatric diagnoses, with some studies making a psychiatric diagnosis using a full psychiatric examination and others using file information only.

Table 4 about here

Other results

Table 5 summarises results from the nine studies (seven from UK and two from Japan) that provide data pertaining to characteristics of offenders with ASD or risk factors in relation to offenders with ASD. On the whole, studies have taken rather different approaches to this issue. Allen, Evans, Hider, Hawkins, Peckett & Morgan (2008), study 8, explored the disposals used in the CJS for people with ASD who offended and found that almost half of the cases in their study were not addressed through the CJS (i.e. they were diverted out of the CJS). They also collected qualitative information from the service users themselves (and Allen et al is the only study to have done this), and from staff about the predisposing and precipitating factors for the offences of the people with ASD (see Table 5). Studies 3 and 17 also examined some predisposing factors, adverse childhood experiences, and they found high rates of physical abuse, neglect and adverse experiences amongst the families

of individuals with ASD who had offended, as compared to those with ASD who had not offended (study 17), while study 3 found the abuse and adverse experiences rates were mostly higher in the ASD group than in the non-ASD offenders.

Table 5 about here

Three studies (18, 19, 20), on the other hand, investigated cognitive profiles, violence ratings, and theory of mind deficits in samples of people with ASD, schizophrenia and personality disorder all of whom had committed serious offences and were living in high secure care in the UK. Murphy found that there were few differences in cognitive test results between the convicted people with ASD and those with personality disorder (study 18), though people with ASD tended to have lower violence ratings (study 18), and to score somewhat higher on one theory of mind task than those with personality disorder, though scoring lower on the other theory of mind task (study 19). They also scored higher on the two theory of mind tasks than the convicted people with schizophrenia (study 19). Similarly, study 22 (Woodbury-Smith, Clare, Holland, Kearns, Staufenberg & Watson, 2005) found very few deficits on tasks involving theory of mind, recognising emotions in others and executive functioning between people with ASD who had offended and those who had not.

Finally, several studies investigated the vulnerabilities of people with ASD. Study 8 by Allen et al (2008) was one of the very few that asked people with ASD themselves, about what they thought led up their offences, and about how they felt about their arrest, the court process, prison and other issues. Not surprisingly, the individuals (all male) reported a range of pre-offending factors (being upset and agitated, being impulsive, having a bad/illegal habit, family conflict, mental health problems, work problems, bereavement) and they often recognised that they had tried to cope in maladaptive ways. While there were some positive accounts of helpful lawyers and/or police, many of the participants found the CJS frightening, stressful and confusing; they felt their Asperger syndrome had often not been understood or taken into account; and they wanted someone to explain to them what was going on. One other study (21, by North, Russell & Gudjonsson, 2008) examined other possible vulnerabilities in people with ASD compared to those without ASD. No differences were reported in suggestibility between the groups, but the ASD group

scored higher on anxiety and depression, paranoia, and on fear of negative evaluation and on compliance than those without ASD.

Discussion

Summary of findings and interpretation

There is some emerging research on people with ASD in the CJS, but the poor quality of much of the research and the variation of both methodologies and specific focus in each study allows only tentative conclusions.

A general failing of most studies was that their samples were small and/or likely to be biased. Sample sizes for people with ASD who were in contact with the CJS/had offended were less than $n = 40$ in seventeen of the twenty two studies (2, 3, 5, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22). Moreover, many studies were not examining unbiased populations of people with ASD (eg a consecutive sample of people diagnosed with ASD in a geographical area), nor unbiased populations in police stations, courts or prisons (the exceptions being studies 3, 4, 9, 10). In addition, the finding from Allen et al (2008) that almost half of the people with ASD who had offended in their participant group did *not* receive CJS disposals must be taken into consideration when considering the results of studies, as it is unlikely that results found in convicted populations, such as in prison and forensic hospitals, are representative of all the people with ASD who have engaged in behaviour that could be construed as offending (Cederlund et al, 2008, also found in their follow-up study that some of their participants with Asperger Syndrome had had contact with the police but it is unclear whether they had been convicted).

The results from the seven existing studies that focused on prevalence rates of ASD in parts of the CJS (Table 1) all found overall rates above 1%, at least in the more able Asperger groups, so it seems likely that people with ASD are somewhat over-represented in the CJS. This conclusion, though, has to be tempered by the knowledge that poor methods for diagnosing ASD were used in the studies with unbiased samples (studies 3 & 4), while the other 5 studies almost certainly had biased samples, since they all came from samples referred for forensic psychiatric assessment or samples resident in forensic psychiatric facilities.

Equally, those six studies that focused on the prevalence of offending in people with ASD (Table 2) are challenging to interpret because so few are without major methodological faults. However, the 4 studies that had non-ASD control groups all reported that people with ASD committed the same number of offences or fewer offences than those without ASD, suggesting that people with ASD are less likely to offend than other people of the same age and gender (or that, if they show offending type behaviour, they are dealt with outside the CJS). Of course, most people with ASD prefer to operate in the social world by strict rules, and it may be that this reduces their likelihood of offending, leading to the findings of these well-controlled studies.

Considering the types of offences committed by people with ASD (seven studies, Table 3), it is again difficult to draw firm conclusions based on the research to date, since over half of the studies either had no controls (three studies) or biased (forensic) samples (three studies) or both (three studies). Moreover, although some of the controlled studies appeared to report higher levels of violent crime in the ASD group (e.g. study 10), others did not (e.g. study 12). Similarly, reports of high rates of arson in the ASD group in uncontrolled studies (e.g. study 2, study 14), were sometimes supported (study 12) but sometimes not supported by the controlled studies (study 3). Given the liking of people with ASD for rules, one interesting finding from a well-controlled study (study 10) was that people with ASD were less likely to commit probation violations than those without ASD. However they seemed more likely to commit crimes involving school disturbances (study 12), perhaps reflecting the difficulties people with ASD have in coping with the school environment.

It is important to consider the role of co-morbid psychiatric diagnoses in people with autism spectrum conditions who offend, especially as some researchers have proposed that offending in this group is best seen as a function of their co-morbid diagnoses, rather than their ASD (Newman & Ghaziuddin, 2008; Woodbury-Smith et al, 2005). There did appear to be a trend of higher rates of psychosis and personality disorder diagnoses, rather than other mental health diagnoses. Nevertheless, the fact that these studies were all conducted in mental health settings may simply mean that such settings are very likely to include people with dual diagnosis.

Very few studies that met the inclusion criteria for the current review carried out any research into the experiences of people with ASD in the CJS, and the one study that did (Allen et al, 2008, study 8) interviewed only 6 people. Nevertheless, the data were illuminating since the individuals provided some support for the ideas that social functioning deficits, life events, mood disturbances and poor emotional coping skills contributed to their offending. The results need to be interpreted with caution, however, due to the small numbers involved. Interestingly though, Allen et al (2008) also gathered information on staff opinions of the precipitating and predisposing factors for offending behaviour and these supported most of the suggestions put forward by Howlin (2004) as to the factors that might predispose people with ASD to offend, i.e. that social naiveté, misunderstanding of social situations, lack of understanding of the rules, and obsessional interests might help explain why some people with ASD offend.

It might be expected that, given their communication deficits and social functioning difficulties, people with ASD might struggle to cope in police interviews and in court, like people with ID do (Murphy & Mason, in press). Evidence from Allen et al's (2008) study suggested that this was indeed the case, and yet North et al (2008) reported no differences in suggestibility between those with ASD and those without, though people with ASD were more compliant. Interestingly, this lack of difference in suggestibility has been confirmed by Maras & Bowler, 2012 (a study not included here because, although the participants had ASD, they were not involved in the CJS). Surprisingly few deficits in theory of mind were also found in a number of studies (Murphy, 2006, 2007; Woodbury-Smith et al 2005).

Limitations

In terms of limitations to the current review it should be considered whether the search terms used were able to capture all available research in this area. The search terms were very broad, covering a wide range of terms used for ASD and for involvement in the CJS. Only one additional study was found by hand-searching the reference lists of the other papers selected after the use of the search terms, suggesting that the original search was reliably targeting the relevant papers. Only one more study not detected by any of the search strategies was later found to report some data on offending type behaviour: Cederlund et al (2008) commented on the numbers of his participants who had been in

contact with the CJS as part of their follow-up of people with Asperger Syndrome and autism.

In terms of limitations of the research included in the review, individually the studies were of reasonable quality and met the inclusion criteria, but the large variety in populations used, from which to draw participants, and the diverse methodologies made direct comparison difficult. Some studies used 'offender only' populations, whilst some used populations within a geographical area, which will clearly impact on how and where the results can be applied. Within those studies that drew their participants from 'offender only' populations there was a likely variability in the reliability of the ASD diagnosis and there were a considerable variety of types of settings from which participants were drawn: court, prison or forensic hospital, which would affect the implications of the findings. Not all studies used comparison or control groups and none of the studies attempted to match groups for factors known to affect criminal offending such as social deprivation, physical abuse and neglect. It was also noticeable that there was a distinct lack of research concerning women with ASD in the CJS. Furthermore, the studies reviewed originated in different geographical areas, and the country in which the research was carried out may have an important influence on the results, as jurisdictions differ in the possibilities for diversion from the CJS, for those seen as vulnerable. Additionally, some countries, such as Sweden, Japan and the USA, used information from national health registers or court registers to include much larger populations of people with ASD than studies carried out in the UK. Even using national registers, however, may not capture an entire population of people with ASD as there are likely to be many people who have undiagnosed ASD. The other methodological difference that made comparison across studies difficult was the diversity of ways in which 'offending' data were gathered, with some studies using file information, some using self-report measures, and others using national statistics on convictions. It must be concluded that the examination of the relationship between ASD and offending is in its infancy. In many ways the studies found mirror the kinds of studies on intellectual disabilities and offending some years ago. This review will hopefully go some way to indicating where improvements can be made to the methodology of studies in the future.

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Figure 1: Flow chart of methodology

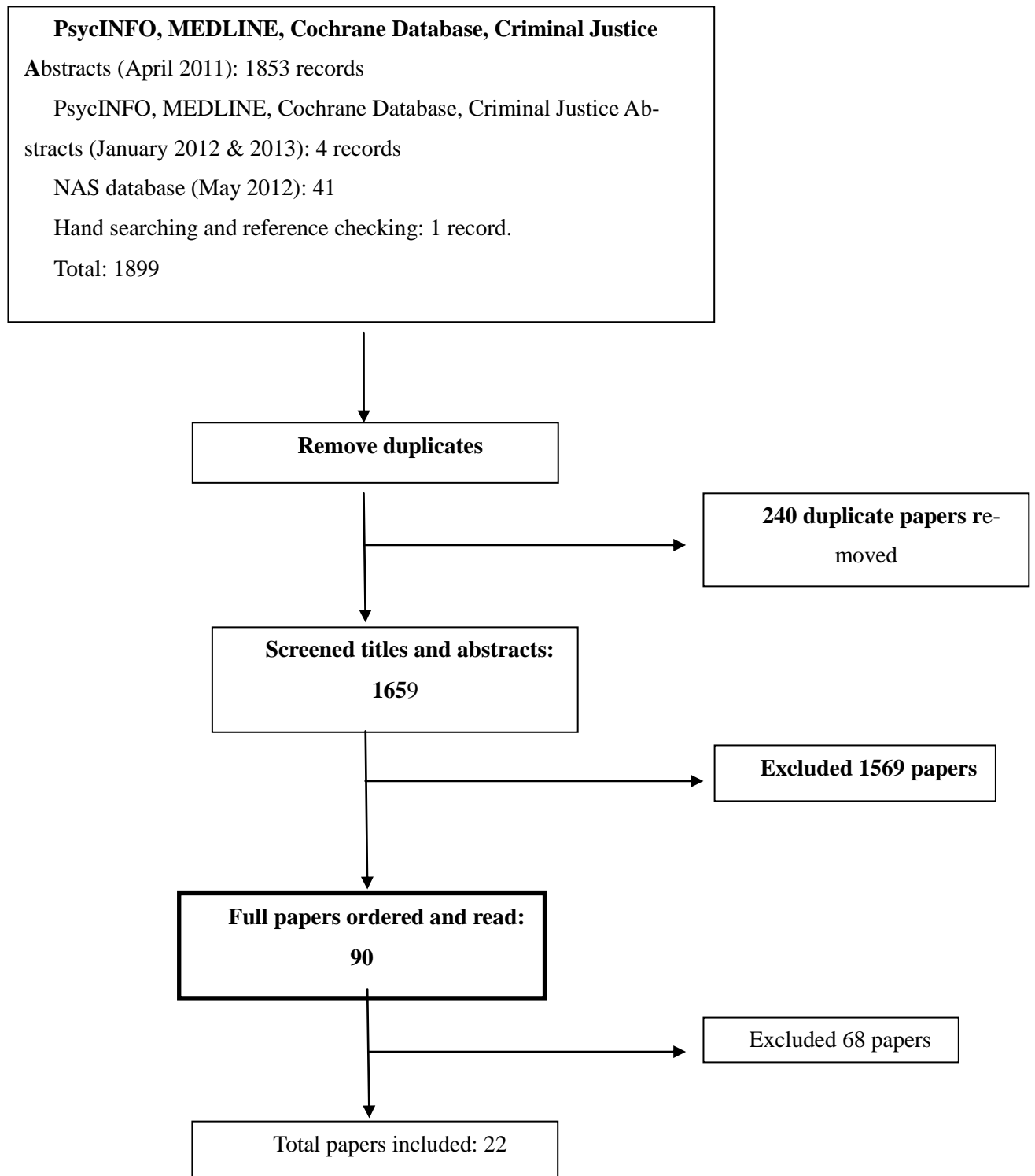


Table 1: Prevalence rates of autism spectrum disorder in offender populations

Studies are listed alphabetically. Studies may appear in several Tables, if they reported several aspects. They retain the number allocated on their first appearance.

Author, Year, Country & Title	Study Population	Number of participants	Methods	Data on prevalence rates. (* = significant differences)
1. Enayati et al, 2008 (Sweden). Psychiatric morbidity in arsonists referred for forensic psychiatric assessment	All offenders convicted in Sweden referred for forensic psychiatric investigation between 1997 and 2001.	Total 2609: 214 arsonists (155 men; 59 women); 2395 other offenders.	Mental state examinations, diagnosis (DSM-IV), psychological testing, personality assessments, life history and ward observations during a 4 week inpatient assessment by a multi-disciplinary team.	<u>Autism</u> : Male arsonists – 1.3%; male other offenders - 0.3%; female arsonists - 0%; female other offenders – 1% <u>Asperger’s syndrome</u> : Male arsonists - 7.1%*; male other offenders - 2.5%*; female arsonists – 3.4%; female other offenders - 2.6%
2. Hare et al, 1999 (UK). A preliminary study of individuals with autism spectrum disorders in three special hospitals.	Population of the three English Special Hospitals (high secure psychiatric hospitals).	<u>Stage 1</u> :1305 screened; 240 reached cut off . <u>Stage 2</u> : 215 of 240 files reviewed.	<u>Stage 1</u> : Total population of hospitals screened with ward staff with specially developed ASD questionnaire. <u>Stage 2</u> : Files reviewed for all over cut-off on screening questionnaire, using criteria for ASD from ICD-10.	N = 1305 31 cases of autism identified Prevalence rate of 2.4%
3. Kumagami & Matsuura, 2009 (Ja-	All juvenile cases tried in four family	Total cases examined =	Semi-structured interview by child psychiatrist (using DSM-IV),	Number of participants in courts A, B, C with Pervasive Developmental Disorder – 11 (3.2%).

pan). Prevalence of pervasive developmental disorder in juvenile court cases	courts in Japan in one year, excluding traffic violations and car accidents.	428.	school records and court records. Adverse childhood experiences questionnaire (see Table 5 for details).	Higher rate of PDD in court D which was a specialist court – 17 (18.2%).
4. Robinson et al 2012 (UK). Evaluation of a screening instrument for autism spectrum disorders in prisoners.	12 prisons in Scotland, including 2 with young offenders.	40% of Scottish prison population: 2458 prisoners (127 women).	<u>Stage 1</u> - screening of all 2458 prisoners on new 20-item instrument, based on ASDI. <u>For sub-sample</u> of 126, relative interviewed on ASDI & person assessed on AQ, Quick test (for IQ), reading & facial emotion recognition test.	97 (4%) of all prisoners scored positive (5 or more) on screening. <u>Sub-sample</u> : 90 of 95 negative on both screening & AQ (5 were positive on AQ). 29 of the 32 positive on screening, & negative on AQ (2 positive on both). 1 refusal. No ASDI interviews positive. ROC curve (screening vs AQ) AUC only 59.6%
5. Scragg & Shah, 1994 (England). Prevalence of Asperger Syndrome in a secure hospital	Entire male population at one high secure psychiatric hospital screened for Asperger Syndrome.	392 screened at stage 1 17 at stage 2 and 3.	<u>Stage 1</u> : Screening of all patients' case notes for 'autistic-type behaviours'. If 3 or more symptoms, went on to stage 2. <u>Stage 2</u> : Screening Schedule for Autistic Behaviour with key nurses. <u>Stage 3</u> : patient interview	N=392. 17 reached stage 2: 6 diagnosed with Asperger Syndrome; 3 more equivocal. Prevalence rate of 1.5% (2.3% including equivocal cases).
6. Siponmaa et al, 2001 (Sweden). Juve-	Young people (15-22yrs): consecutive	126 (originally 130, but rec-	Interviews with all patients by social worker; assessments by	Pervasive Developmental Disorder– 34 (27%) Pervasive Developmental Disorder - Not Otherwise

nile and Young Adult Mentally Disordered Offenders: The role of Child Neuropsychiatric Disorders	referrals to Forensic Psychiatric service, over 5 yrs, after committing serious offences.	ords for 4 participants not available)	psychologists; psychiatric interview & psychiatric state examination; some relatives interviewed; IQ tests also completed.	Specified – 21 (17%) Asperger Syndrome – 13 (10%)
7. Soderstrom et al, 2004 (Sweden). Adult psychopathic personality with childhood-onset hyperactivity and conduct disorder: a central problem constellation in forensic psychiatry	People referred for forensic psychiatric investigation by court, following severe violent or sexual crimes (all later convicted in court).	100 cases 92 men 8 women	Axis 1 disorders: SCID-I; Yale-Brown Obsessive-Compulsive Scale (Y-BOCS); AS Screening Questionnaire (ASSQ) & AS Diagnostic Interview (ASDI). Personality Disorder: SCID-II; PCL-R. Life History of Aggression Scale . Interviews; file reviews; some interviews with relatives.	N = 100 Autism - 5 (5%) Asperger Syndrome - 3 (3%) Autistic Spectrum Disorder (NOS) - 10 (10%)

Key to abbreviations used in tables: ASD: Autistic Spectrum Disorder; PDD: Pervasive Developmental Disorder; AS: Asperger Syndrome

Table 2: Prevalence of offending behaviour in people with ASD

Author, Year, Country & Title	Study Population	Number of participants	Methods	Data on prevalence rates.
8. Allen et al, 2008 (England) Offending Behaviour in Adults with Asperger Syndrome	Adults in South Wales with AS and in contact with community services, forensic services, autism services, probation services or prisons.	126 people with AS, 33 with offending histories. <u>Subsamples:</u> staff questionnaires on n=16; interview with person n=6.	All diagnosed with AS. Informant questionnaires, on history & behaviour, plus ASDI, completed with staff; semi-structured interviews with person with AS (all male).	126 people with ASD identified in area. 33 had engaged in offending behaviour. Prevalence rate of 26%.
9. Brookman-Frazee et al, 2009 (USA). Involvement of youths with autism spectrum disorders or intellectual disabilities in multiple public service systems	Stratified random sample of all 12,662 children aged 6-17yrs receiving services in one/more system (mental health, special, child welfare, alcohol/drug, juvenile justice.	3402 randomly selected but 23% not located, 25% refused. Of the 2609 contacted, 1603 provided data.	Parents interviewed re child's mental health, special needs & other factors. Child Health Questionnaire (CHQ-PF28) & Child behaviour Checklist (CBCL) completed & psychiatric diagnosis by DISC-IV.	Of the 1603 youths enrolled in at least one service system, 42 had ASD by parent report (& 178 had ID). Fewer children with ASD/ID were involved in the juvenile justice system than children without ASD/ID (11% vs 31%)
10. Cheely et al, 2012 (USA).	Young people (12-18 years of age) regis-	609 identified with ASD	File review by 2 clinicians for diagnoses.	Of 609 young people with ASD, 32 had contact with Dept for Juvenile Justice. So prevalence rate = 5.24%.

The prevalence of youth with autism spectrum disorders in the CJS	tered on the South Carolina Autism & Developmental Disabilities Monitoring Project.		ASD monitoring database linked to records at Dept of Juvenile Justice to review charges.	Mean number of charges per person for these 32 people with ASC was 3.3, compared to mean of 5.7 for a comparison group of non-ASC youths (i.e. signif fewer charges for ASC group).
11. Hippler et al, 2010 (Austria). Brief Report: No increase in criminal convictions in Hans Asperger's Original Cohort	Data from archives of Vienna University. All individuals seen by Hans Asperger or colleague in Vienna , 1951 – 1986.	73 in AP group (autism / Asperger), of whom 12 women. 104 in AF group (autistic traits, but no diagnosis).	File review for diagnosis. Criminal Records Search (Austrian Penal Register).	Results from AP group only - N=73; only 2 convictions. Prevalence rate of 2.74%. Prevalence rate for offending no different from general population rates.
12. Mouridsen et al, 2008 (Denmark). Pervasive developmental disorders and criminal behaviour: a case control study	Follow-up of consecutive series of children with PDD, seen as in-patients, at Univ. Clinics of Child Psychiatry, Copenhagen & Aarhus 1960 -1984. All now adult.	341 with PDD (113 childhood autism, 86 atypical autism, 114 AS). Matched control group: 933 children without PDD, from general population.	File review for diagnosis. All participants (PDD and non-PDD) screened through the nationwide Danish Criminal Register to ascertain convictions.	<u>Childhood autism group</u> (n=113): 0.9% had criminal record vs 18.9% in Control group (n=339). <u>Atypical autism group</u> (n=86): 8.1% had criminal record vs 14.7% in Control group (n=252). <u>Asperger group</u> (n=114): 18.4% had criminal record vs 19.6% in Control group (n=342).
13. Woodbury-Smith et al, 2006 (England). High func-	Adults with ASD living in one Health District in England	102 adults with ASD identified but some declined etc.	Self-reported law breaking: Using the Self-Reported Offending Questionnaire.	Groups not significantly different for age or gender. 12 of the 25 ASD group self-reported crime (48%) compared with 16 of the 20 comparison group (80%) –

tioning autistic spectrum disorder, offending and other law breaking: findings from a community sample.	(diagnosed by ADI-R & IQ>70).	Final sample: 25 adults with ASD. Comparison group of 20 volunteers without ASD.	Official statistics of offending behaviour (for ASD group only): Home Office Offenders Index (contains only serious crimes data).	significant at p<0.05. Only 2 people with ASD (8%) were listed on the Offender Index
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Table 3: Types of offences committed by people with ASD

Author, Year, Country, Title	Study Population	Number of participants	Methods	Types of offence (* = statistically significant difference)
8. Allen et al, 2008 (England). Offending Behaviour in Adults with Asperger Syndrome	Adults in South Wales with AS in contact with services (see Table 2), & had CJS involvement.	See Table 2 for details of sample. For details of type of offences: staff interview data used n=16	Informant questionnaires completed with staff.	Violent conduct – 13 (81%); threatening behaviour – 12 (75%); property destruction – 8 (50%); drug offences – 4 (25%); theft – 4 (25%); sexual offending – 3 (19%); fraud – 1 (6%); motoring offences – 1 (6%); murder – 1 (6%)
10. Cheely et al, 2012 (USA). The prevalence of youth with autism spectrum disorders in the CJS	Young people (12-18 years) on Autism Monitoring Project (see Table 2) & had contact with CJS. Comparison with matched non-autistic group with contact with CJS.	Type of offence: data from n=32 with contact with Dept for Juvenile Justice. Comparison group: 3 matches for each ASD person.	File review by 2 clinicians to confirm diagnoses. Records from the Dept of Juvenile Justice reviewed for all participants.	<u>ASD group (n=32) / Comparison group (n=99)</u> Crimes against people – 38.8% / 19.8%* Crimes against property – 20.4% / 28.6%* Drug crimes – 3.9% / 6.7% Offences against public order – 30.1% / 33% Disturbing schools – 15.5% / 7.1%* Probation violations – 1.9% / 7.2%* Status offences – 5.8% / 7.1% Other – 0% / 0.4%

<p>2. Hare et al, 1999 (England). A preliminary study of individuals with autistic spectrum disorders in three special hospitals in England.</p>	<p>Population of three special hospitals (high secure psychiatric hospitals) in July 1997. AS: n=21 Autism IQ>50: n=4 Autism IQ<50: n=6</p>	<p>For details of full sample see. For type of offence, data given refers to the 31 people with AS or autism.</p>	<p>For some of the 31 participants with ASD there was no index offence, as management difficulties in previous placement led to transfer to high security service.</p>	<p><u>Index offence (n=31)</u> <u>Asperger Syndrome</u> /Autism (IQ>50)/ Autism (IQ<50) Homicide – 28.56% / 25% / 16.7% Violence / assault – 38.1% / 25% / 16.7% Threatening to kill – 9.52% / 0% / 0% Arson – 19.05% / 25% /0% Sexual offending – 4.76% /0% / 0% No index offence – 0 / 25% / 66.7%</p>
<p>3. Kumagami & Matsuua, 2009 (Japan). Prevalence of pervasive developmental disorder in juvenile court cases in Japan.</p>	<p>All juvenile court cases in four family courts in Japan between April 2006 and March 2007. For details of full sample see Table 1.</p>	<p>Type of offence: data is from 28 people with PDD from all 4 courts. Comparison group: 289 cases no PDD, from courts A, B, D.</p>	<p>Semi-structured interview School records Court records</p>	<p>Property crime (stealing) – 4 (14.2%); rough crimes (wounding) – 4 (14.2%); robbery, attempted murder – 4 (14.2%); sexual crime – 5 (17.8%); drug – 0; arson – 1 (3.5%); status before crime – 1 (3.5%); trespassing – 4 (14.2%); guns, weapons – 0; misdemeanour – 0; other – 5 (17.8%) (Non-PDD group: only significant differences were property crime higher in non-PDD; sexual crimes higher in PDD group)</p>
<p>12. Mouridsen et al, 2008 (Denmark). Pervasive developmental</p>	<p>All adults seen as inpatients as children with pervasive developmental disorders (PDD) at the Univ. Clinics of Child Psy-</p>	<p>For type of offence, data given is from the 29 with ASD who had offended (out</p>	<p>See Table 2</p>	<p><u>Childhood Autism Group (1 out of 113)</u> Only 1 person convicted (no details given about type of offence). <u>Atypical autism group (7 of 86) / Control (37 of 252)</u> Violent crimes: 2.3% / 1.6%; robbery: 2.3% / 0.4%; possession of weapons: 2.3% / 0.8%; sexual offending:</p>

disorders and criminal behaviour: a case control study.	chiatry of Copenhagen and Aarhus 1960 - 1984 and had criminal convictions as adults. See Table 2 for details of full sample.	of 313).. Matched control group of children from general population database, without PDD.		<p>0% / 0.8%; arson: 2.3% / 0.4%; theft: 4.7% / 2.8%; drugs: 2.3% / 1.2%; vandalism: 1.2% / 0.8%; fraud: 1.2% / 2.0%; offences against property: 2.3% / 1.6%; receiving stolen goods: 1.2% / 1.2% ; driving offences: 1.2% / 11.5%*; other: 0%/ 2.8%</p> <p><u>Asperger group (21 of 114) / Control (67 of 342)</u></p> <p>Violent crimes: 1.8% / 2.3%; robbery: 1.8% / 0.9%; possession of weapons: 2.6% / 0.9%; sexual offending: 3.5% / 0.9%; arson: 4.4% / 0%*; theft: 7% / 3.5%; drugs: 1.8% / 2.3%; vandalism: 1.8% / 1.2%; fraud: 2.6% / 1.5%; offences against property: 2.6% / 1.5%; receiving stolen goods: 0.9% / 1.2%; driving offences: 5.3% / 15.5%*; other: 3.5% / 5.3%</p>
13. Woodbury-Smith et al, 2006 (England). High functioning autistic spectrum disorder, offending and other law breaking: findings from a community	Adults with ASD living in one Health District in England (had to be diagnosed with ADI-R interview & have IQ>70). See Table 2 for details of whole sample.	For types of-fence: 25 adults with ASD, 12 with self-reported crime. Comparison group: 20 volunteers without ASD, 16 with self-reported crime.	<p>Self-reported law breaking:</p> <p>Self-Reported Offending Questionnaire.</p> <p>Official statistics (ASD group only): Home Office Offenders Index.</p> <p>File review</p>	<p><u>ASD group / Comparison group</u></p> <p>Burglary = 4% / 0%</p> <p>Robbery = 0% / 0%</p> <p>Theft: handling stolen goods = 9% / 10%</p> <p>Theft: shoplifting = 11% / 20%</p> <p>Theft: other = 0% / 0%</p> <p>Drug offences = 11% / 55%</p> <p>Criminal damage = 19% / 0%</p> <p>Violence = 30% / 25%</p>

sample.				
14. Woodbury-Smith et al, 2010 (England). Circumscribed interests and offenders with autism spectrum disorders: a case control study.	ASD offenders from: Medium Secure hospitals; a national diagnostic clinic for adults with suspected AS or HFA; & the local health district. ASD non-offenders from local health services (diagnosis of AS or HFA but no offending).	Autistic offenders = 18 men & 3 women Autistic non-offenders = 23 men & 3 women.	Semi – structured interview (current interests, change in interests over time, time spent on interest) Health-care records from time of index offence reviewed (Autistic offender group only)	N= 21 (offender group only) Arson = 23.81%; Deception = 4.76%; Harassment = 4.76%; GBH = 4.76% ; ABH = 4.76%; Threats to kill = 19.05%; Indecent assault = 14.29%; Manslaughter = 9.52%; Hoax bomb threats = 4.76%; Armed robbery = 4.76%; Assault = 4.76%; Attempted murder = 4.76%

Table 4: Psychiatric diagnosis in addition to ASD

Author, Year, Country & Title	Study Population	Number of participants	Methods	Psychiatric diagnosis (PD= Personality Disorder)
2. Hare et al, 1999 (UK). A preliminary study of individuals with autistic spectrum disorders in three special hospitals in England.	Population of the three English special hospitals (high secure psychiatric hospitals) in July 1997.	For full details of the study see Table 1. For co-morbid psychiatric diagnoses, only those (n=31) with ASD considered here.	See Table 1 for details of first stages. For co-morbid diagnoses: Psychiatric diagnosis taken from file information – original diagnoses made by psychiatric staff (pre 1995).	Autistic Spectrum 9.68%; schizophrenia 35.48%; schizo-affective 3.23%; schizophrenia & PD 6.45%; Affective Disorder 6.45%; Affective Disorder & PD 3.23%; PD/mental illness/learning disability 3.23%; PD 19.35%; Schizoid Personality 3.23%; Organic Disorder 9.68%; Other / None 9.68%.
15. Långström et al, 2009 (Sweden). Risk factors for violent offending in autistic spectrum disorder: a national study of hospitalised individuals.	All individuals discharged from hospital in Sweden 1/1/1988 to 31/12/2000, with diagnosis of psychiatric disorder, 15 yrs + in 2000. 1,421,795 files reviewed	1089 had diagnosis of ASC. After excluding deceased & those <15 yrs –total with ASD 422 (317 autism; 105 AS).	Information from the inpatient / hospital discharge register reviewed for diagnosis of ASC. Cross-referenced with the National Crime Register for people who had committed a violent crime during 1998 – 2000.	<u>Current co-morbid psychiatric diagnosis.</u> <u>ASD & violent crime vs. ASC no violent crime:</u> Schizophrenia / psychosis = 25.8% / 9.2%; Depressive disorder = 0% / 3.8% Substance use disorder = 16.1% / 0.5% PD = 9.7% / 1.5%; Other psychiatric disorder = 38.7% / 12.8%.
16. Wahlund & Kristiansson, 2006	All males guilty of homicide or man-	N=35 – 27 with Anti-social PD and	File review. Psychiatric diagnoses made dur-	<u>Current co-morbid psychiatric diagnosis.</u> <u>Autism Group (N = 8)</u>

(Sweden). Offender characteristics in lethal violence with special reference to antisocial and autistic personality traits	slaughter & referred for forensic psychiatric assessment in Sweden 1996 – 2001, diagnosis of either antisocial PD or ASD.	8 with ASC. (37 initially – 2 excluded, due to diagnostic uncertainties).	ing forensic psychiatric assessment. Wechsler Adult Intelligence Scale - Revised Psychopathy Checklist – Revised (PCL-R)	PD: 5 (62.5%); Substance abuse: 4 (50%) IQ < 85: 2 (25%); IQ 85-115: 5 (62.5%); IQ > 115: 1 (12.5%)
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Table 5: Other characteristics and risk factors in relation to offending

Author, Year, Country & Title	Study Population	Number of participants	Methods	Other information
8. Allen et al, 2008 (England). Offending Behaviour in Adults with Asperger Syndrome	Adults in South Wales with Asperger Syndrome who had involvement with the Criminal Justice System	16 participants for whom staff interviewed. 6 people with AS also interviewed. Total = 16	Informant questionnaires completed with staff. Semi-structured interview completed with person with Asperger Syndrome	<u>Disposal</u> : Prison 31%; Hospital disposal 6%; Community Order 19%; No further action / not through CJS 44%. <u>Predisposing factors to offending (staff view)</u> : Lacked concern for outcome 94%; social naivety 88%; lacked awareness of outcome 82%; impulsivity 63%; misinterp. of rules 63%; overriding obsession 44% <u>Precipitating factors for offending (staff view)</u> : Social rejection – 69%;; bullying – 50%; sexual rejection – 50%; family conflict – 50%; deterioration in mental health – 31%; change of domicile – 25%; change in professional support – 19%; bereavement – 13%.
17. Kawakami et al, 2012 (Japan). The risk factors for criminal behaviour in high-functioning autism spectrum disorders	ASD group: all diagnosed by child psychiatrists using DSM-IV (age range 6-30yrs) – divided	ASD: 175 (147 men, 28 women) - 36 with criminal history & matched group of 139 with-	Logged: Childhood adversity: parent mental illness, substance abuse or criminality, family violence, physical or sexual abuse,	Types of criminal behaviour included theft (55%), sexual misconduct (25%), violence (25%), running away (19%, arson (11%), blackmail (6%), other (spoof emails) (3%). ASD criminal group significantly higher than ASD non-criminal group on age at diagnosis & on

(HFASDs): A comparison of childhood adversities between individuals with HFASDs who exhibit criminal behaviour and those with HFASD and no criminal histories.	into offenders and non-offenders.	out.	neglect. Plus: parental death, divorce, or loss, life threatening childhood illness, extreme economic adversity.	childhood adversity in: family violence, physical & sexual abuse & neglect, parental death, divorce and other parental loss. Regression showed age of diagnosis, physical abuse & neglect most important.
3. Kumagami & Matsuura, 2009 (Japan). Prevalence of pervasive developmental disorder in juvenile court cases in Japan.	All juvenile court cases in family courts in Japan between April 2006 and March 2007.	See Table 1 for details. 28 with PDD	Semi-structured interview (including the Adverse Childhood Experiences questionnaire) School records Court records	<u>Adverse Childhood Experiences</u> <u>PDD group (n = 28) / non-PDD (n=289)</u> Recurrent physical abuse – 21.4% / 11.8% Recurrent emotional abuse – 25% / 10.7% Sexual abuse – 0% / 0.3% Alcohol / drug user in house – 10.7% / 5.5% Mother treated violently – 10.7% / 9.7% Mental illness in the home – 10.7% / 10.4% One or no biological parents – 50% / 42.7% Incarcerated household member – 7.1% / 7.6% Neglect by parents – 17.8% / 8.6%
18. Murphy, 2003 (UK). Admission and cognitive details of male patients diagnosed with Asperger syndrome detained in a	3 groups from high secure hospital, all with history of serious offences: AS group & random	N=13 males in each group: AS; Schizophrenia; PD. All 20-40 yrs old.	WAIS – R; NART- R Weschler Memory Scale; Adult Memory & Information Processing Battery; Classical Weigl; Violence	AS group & PD group younger on admission than Schizophrenia group. AS group less likely used alcohol than the other groups; had lower violence ratings than the other groups; had higher WAIS than schizophrenia group & higher reading scores than both other groups.

special hospital: comparison with a schizophrenia and PD sample.	selection of those with schizophrenia or PD		Rating Scale	AS group and PD group: both higher scores on some subtests of WAIS c.f. schizophrenia group. No differences on test scores on Weigl. Very few differences in scores between AS group and PD group.
19. Murphy, 2006 (England). Theory of mind in AS, schizophrenia and PD forensic patients.	Male patients detained under the Mental Health Act (1983) in high secure psychiatric care in England.	As above. Total – 39: AS 13; Schizophrenia 13; PD 13.	Diagnoses made by clinicians using ICD-10 criteria. WAIS-R; Theory of Mind Tasks: The revised eyes task & Modified advanced theory of mind test.	<u>Theory of Mind Task 1</u> : % of answers correct Asperger 94.4%; Schizophrenia 79.5%; PD 89.7% <u>Theory of Mind Task 2</u> : % of answers correct Asperger 52.7% ; Schizophrenia 33.3%; PD 74.3%
20. Murphy, 2007 (England). Hare Psychopathy Checklist Revised profiles of male patients with AS detained in high security psychiatric care.	A group of male patients with AS detained in high security psychiatric care in England.	13	Diagnosis of Asperger made by experienced clinicians using the Gillberg and Gillberg criteria. Theory of Mind Tasks: The revised eyes task & Modified advanced theory of mind test.	Results = % of answers correct on tasks. Theory of Mind Task 1 – 76.9% Theory of Mind Task 2 – 30.8%
21. North et al, 2008 (England). High functioning autistic spectrum disorders: an investigation of psychological vulnerabilities during interrogative inter-	People with ASD from diagnostic clinic & existing ASD database. Non-ASD group from a control data	26 people with ASD (21 men, 5 women): 8 had history of arrest 27 matched people without ASD (21	Gudjonsson Suggestibility Scale; Gudjonsson Compliance Scale; Hospital Anxiety & Depression Scale; Brief Fear of Negative Evaluation Scale;	ASD vs control group: No significant differences on any GSS scores (recall, confabulations, Yield, Shift) ASD group significantly higher than controls on compliance; on anxiety & depression; on fear of negative evaluation & on paranoia

viewing.	base	men, 6 women): 4 had history of arrest	Paranoia Scale	
22. Woodbury- Smith et al, 2005 (UK). A case-control study of offenders with high functioning autistic spectrum disorders	3 groups: (a) ASD offenders from services (b) ASD non-offenders: from local health district (c) General population: volunteers.	ASD offenders: 18 men + 3 women ASD non-offenders: 20 men & 3 women General population: 17 men + 6 women	<u>Theory of mind</u> : Eyes Test Revised. <u>Executive functioning</u> : behavioural Assessment of Dysexecutive Syndrome; Facial Expressions of Emotion Stimuli & Tests (FEEST) <u>IQ</u> : WASI.	<u>ASD offenders vs ASD non-offenders</u> : No significant differences on total scores of any test <u>ASD offenders vs general population</u> : No significant differences on total scores of any test; significantly worse on fear only in FEEST <u>ASD non-offenders vs general population</u> : Non- offenders significantly worse on Dysexecutive syndrome tests & Eyes test; also worse on some emotions in FEEST (though not on total FEEST scores)
14. Woodbury-Smith et al, 2010 (England). Circumscribed interests and offenders with autism spectrum disorders: a case control study.	ASD offenders & ASD non-offenders – see Table 3 for details	Autistic offenders = 18 men & 3 women Autistic non-offenders = 23 men & 3 women.	Semi – structured interview on interests. Health-care records from time of index offence reviewed (Autistic offender group only)	Special circumscribed interests investigated in relation to crimes (for n=21 offender group only). More of ASD offender group had special interests involving violence (19%), than ASD non-offender group (0%). Only one had a linked offence though. For n=2 others: clear links between special interest & offence.

