

Offence type and neurodiversity: A comparison of 12-17-year-old boys charged with a criminal offence by diagnosis of autism spectrum disorder, attention deficit hyperactivity disorder or both

Alexa X. Rutten^{1,2}  | Maaïke Kempes³  | Ilja L. Bongers^{1,2}  |
Robert R. J. M. Vermeiren⁴  | Chijs van Nieuwenhuizen^{1,2} 

¹GGzE Centre for Child and Adolescent Psychiatry, Eindhoven, The Netherlands

²Tilburg University, Tranzo, Scientific Center for Care and Wellbeing, Tilburg, The Netherlands

³Netherlands Institute of Forensic Psychiatry and Psychology, Utrecht, The Netherlands

⁴Department of Child and Adolescent Psychiatry, LUMC-Curium, Leiden University Medical Center, Leiden, The Netherlands

Correspondence

Alexa X. Rutten, Tilburg University, Tranzo, Scientific Center for Care and Wellbeing, PO BOX 90153, 5000 LE Tilburg, The Netherlands.

Email: Alexa.Rutten@ggze.nl

Abstract

Background: Autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) have been evidenced as common among adolescents with delinquent behaviour. Less is known, however, about the relationship between these disorders and type of alleged offence, when the adolescent is involved with the criminal justice system.

Aim: Our aim was to investigate whether the type of alleged index offences among 12–17-year-olds differ between those diagnosed with ASD, ADHD or ASD + ADHD.

Method: The sample was selected for ASD and/or ADHD diagnoses from a database of all pre-trial forensic psychiatric and psychological assessments of male adolescents of 12–17 years old in the Netherlands for the years 2013 and 2014. For each record, independent researchers scored a 76-item checklist encompassing health and offending characteristics. Sixty-nine of the 1799 pre-trial assessments of these male adolescents had a diagnosis of ASD, 90 of ADHD and 29 had been diagnosed with both; these 188 cases formed our sample.

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Results: The rate of sex offences was significantly higher among those with ASD ($N = 20, 29\%$) than those with ADHD ($N = 10, 11\%$) or both ($N = 4, 14\%$; Fisher's exact test = 8.54; $p = 0.014$). By contrast, the rate of property offences without violence was significantly higher among those with ADHD ($N = 22, 24\%$) than those with ASD ($N = 4, 6\%$) or both ($N = 5, 17\%$; Fisher's exact test = 10.50, $p = 0.004$), whereas violent offending rates did not differ between the three groups.

Conclusion: Specific offence types were not equally distributed among male adolescents with different psychiatric diagnoses. In our sample of male adolescents suspected of an offence nearly one-third of those diagnosed with ASD were convicted of a sex offence, suggesting highly specialised needs for further assessment and intervention. Among those diagnosed with ADHD, significantly more adolescents were charged with non-violent property offences. Such unequal distribution of alleged offence types among adolescents with different psychiatric diagnoses justifies tailor-made attention for offending adolescents with different psychiatric diagnoses.

KEYWORDS

ADHD, adolescent delinquency, ASD, forensic mental health assessment, juvenile delinquency

1 | INTRODUCTION

Several studies have shown high rates of psychiatric disorders in adolescents who offend (Cauffman, 2004; Colins et al., 2010; Underwood & Washington, 2016; Vermeiren, 2003; Vreugdenhil, et al., 2004), although only a minority of young offenders are diagnosed and treated promptly (Doreleijers, et al., 2000).

Both autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) are common among male adolescents with delinquent behaviours but less is known about their associations with criminal justice involvement. Focus on ASD and ADHD is particularly interesting, as these disorders have partly overlapping neuropsychiatric characteristics but different symptoms, signs and aetiological factors (Craig, et al., 2015) and may co-occur.

Research into the co-occurrence of specific psychiatric disorders and certain types of delinquent behaviour is scarce. In a study of young people suspected of a sexual offence, solo peer offenders and child molesters were found to be more likely than sexual group offenders to report features of ASD ('t Hart-Kerkhoffs et al., 2009). In another study by Cheely et al. (2012) on the prevalence of ASD among young people in the criminal justice system, the rate of crimes against people was higher among young people with ASD, but property crimes lower, than among matched controls.

ADHD has also been identified as a risk factor for criminal and delinquent behaviour—particularly in combination with other psychiatric disorders, such as oppositional defiant disorder, conduct disorder and substance use disorder (Knecht, et al., 2015). Young and Cocallis (2021), in their review of ADHD among young and adult offenders, emphasised the importance of early identification and treatment for more positive health, social and criminal justice outcomes. Colins et al.'s (2010) review indicated that 14% of young offenders were diagnosed with ADHD, a much higher prevalence than among under-18-year-olds in general. Furthermore, in boys diagnosed with ADHD in childhood, the prevalence of serious offending has been shown to be significantly higher than among boys without ADHD (Sibley et al., 2011). ADHD is also associated with younger age at first arrest, number of violent and non-violent offences and proclivity to re-offend. Fazel and colleagues' (2008) review has revealed high rates of ADHD among adolescents in juvenile detention and correctional facilities. In Cohn and colleagues' (2012) study on the predictive validity of externalising psychopathology for the persistence of delinquency in childhood first-time arrestees aged under 12, co-morbid ADHD and oppositional defiant disorder/conduct disorder (ODD/CD) were found to be significantly more common in the group of persistent serious offenders than in the occasional offender group. Nevertheless, direct associations between ADHD and specific types of offending have not been found (Román-Ithier et al., 2017).

In sum, several studies have shown that ASD and ADHD are linked with specific types of offending behaviour. Prior studies have, however, focused on just one type of offending behaviour or one of these disorders. Our aim was to investigate whether the types of offending behaviour of 12-up to and including 17 year-old male adolescents, who had been undergoing a forensic psychiatric or psychological assessment in that context, differ between those diagnosed with ASD, ADHD or with both.

2 | METHODS

2.1 | Ethics

The Psychological Ethics Committee of Tilburg University approved the study (EC-2015.45).

2.2 | Sample

A Dutch database containing 1799 pre-trial forensic assessment reports from the years 2013 and 2014 of male adolescents aged 12–17 years, at the time of their alleged index offence was the source of our sample. Based on a medium effect size and an *a priori* power of 0.80 we calculated a necessary sample size of 180. From this database, we selected the records of all who had been diagnosed with ASD, ADHD or ASD + ADHD according to the pre-trial forensic assessment report.

In the first random selection of records from the database more male adolescents with ADHD were selected than male adolescents with ASD. To avoid oversampling of male adolescents with ADHD in the second random selection, only records of male adolescents with ASD or ASD and ADHD were included in the sample. In the final sample of 188 records all male adolescents diagnosed with ASD in the database of pre-trial forensic assessments reports were included.

The database of pre-trial forensic assessment reports is administered by the Netherlands Institute of Forensic Psychiatry and Psychology (NIFP), a department of the Dutch Ministry of Justice and Security. Each year, around 900 pre-trial assessments of 12 to 17-year-olds are carried out by psychiatrists and psychologists; as about 94% of them concern males, only those pertaining to males were included in this study. Reports are generated because the prosecutor can ask for a psychological or psychiatric assessment or both, after an adolescent has been charged with a crim-

inal offence. In each pre-trial assessment, questions about criminal responsibility and risk assessment are answered and the mental and/or developmental disorder(s) are described. Subsequently, all relevant psychiatric, psychological and forensic findings are integrated to establish criminal responsibility, risk assessment and recommended risk management. The pre-trial forensic assessment contains an evaluation, as far as possible, of the adolescents' mental state at the time of the offence and thus the extent to which the mental state at the time was related to the offence with which they have been charged.

2.3 | Forensic assessment reports

The 188 selected assessments were anonymised by the NIFP before being provided to the researcher. They varied in length and details but they all met the guidelines of up-to-date psychiatric and/or psychological forensic assessment (NIFP, 2018; NVVP, 2013). As part of the standard procedure, a psychiatrist or psychologist of the NIFP, as well as a legal expert, checked all the forensic assessment reports. The following information forms part of such forensic assessments: (1) the acts of which the juvenile has been accused, (2) background and demographic information, (3) a description of current and possible previous criminal acts, and (4) diagnostic considerations. The criteria for examination by a psychiatrist as well as a psychologist are the severity of the offence or because the criminal sanction required both a psychiatric and a psychological examination. Two researchers independently extracted data from the pre-trial forensic assessments. In cases where there was both a psychiatric and a psychological forensic assessment report, data were scored only from the psychiatric reports, to ensure equivalent distribution of data.

2.4 | Measurements

The assessment reports were scored by using a 76-item checklist, the checklist is available upon request. Background characteristics such as psychiatric diagnoses, level of education, living conditions and use of medication around the time of the alleged index offence as charged were collected. Education level indicates the highest graduation level attained. In addition, the following characteristics of the index offence and, separately, of prior offences were registered: type (by Dutch offence code), victim's age, the offender's relationship with the victim (if any), use of a weapon, motive, and use of medication and/or alcohol and/or illicit drugs. Also scored were whether the crime was committed alone or in a group, and whether the offence was overt or covert. Finally, previous offences, convictions, psychiatrists' or psychologists' recommendations for treatment, and within which legal framework treatment should take place were noted. The alleged index offences were then classified by seriousness in accordance with the classification used by Van Kordelaar (2002) and Mulder et al. (2012).

The items in the checklist were scored, using the anonymised records by the principal researcher (AR) and a trainee. All files were completed by means of consensus scoring until an interrater reliability of at least $k = 0.80$ (Cohen's kappa) was achieved. Halfway through the scoring, the interrater reliability was checked again and proved satisfactory $k > 0.80$.

2.5 | Statistical analyses

The descriptive statistics were calculated using SPSS (Statistical Package for the Social Sciences, version 19.0). Differences between the group of adolescent offenders with ASD, ADHD and ASD + ADHD were tested using a chi-square or Fisher's exact test for categorical data (such as offences) and a *t*-test for continuous variables (age). For all calculations, the level of statistical significance was set at 0.05.

3 | RESULTS

3.1 | Background characteristics of the young offenders

All 188 identified pre-trial assessment reports included the diagnoses of interest, accounting for 10.5% of the assessment reports for the years 2013–2014: 69 were of ASD, 90 of ADHD and 29 with both ASD and ADHD. Table 1 shows the distribution of additional disorders across these groups. The most common comorbid disorder was disruptive

TABLE 1 Background characteristics of the juveniles suspected of delinquency; psychiatric comorbidity, highest education, living conditions and use of medication at the time of the index-offence

	Total sample (N = 188)		ASD (n = 69)		ADHD (n = 90)		ASD + ADHD (n = 29)		Fisher's exact test	p-value								
	n	%	n	%	n	%	n	%										
Axis-I classification of DSM-IV-TR ^{a,b} other than ASD or ADHD																		
Disruptive behaviour disorder	68	36.2	19	27.5	41	45.6	8	27.6	6.435	0.039*								
Substance disorder	38	20.2	11	15.9	19	21.1	8	27.6	1.879	0.413								
Reactive attachment disorder	10	5.3	5	7.2	3	3.3	2	6.9	1.639	0.510								
Other disorder usually first diagnosed in infancy, childhood, or adolescence ^c	10	5.3	3	4.3	5	5.6	2	6.9	0.527	0.828								
Other disorders ^d	16	8.5	6	8.7	7	7.8	3	10.3	0.394	0.937								
Highest level of education ^e									17.335	0.044**								
Elementary school	4	2.2	1	1.5	3	3.4	-	-										
School for practical education	11	5.9	2	2.9	6	6.7	3	10.3										
Special secondary education	67	35.8	29	42.0	30	33.7	8	27.6										
Secondary vocational education	65	34.9	20	29.4	38	42.7	7	24.1										
Senior general secondary school/pre- university school	20	10.8	11	16.2	5	5.6	4	13.8										
Senior secondary vocational education	19	10.2	5	7.4	7	7.9	7	24.1										
Living condition at the time of the index offence									12.964	0.036**								
Living with both biological parents	61	32.4	30	43.5	20	22.2	11	37.9										
Living with one biological parent	81	43.1	22	31.9	49	54.4	10	34.5										
Residential care	35	18.8	14	20.3	14	15.6	7	24.1										
Other living condition; adoptive family; foster family	11	5.9	3	4.3	7	7.8	1	3.4										
Medication at the time of the index-offence									64	33.5	14	22.2	31	34.4	18	62.1	15.560	0.000

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; ASD, autism spectrum disorder; DSM-IV-TR, Diagnostic and Statistical Manual of Mental Disorders (4th ed; revised, American Psychiatric Association; 2000).

^aOnly DSM-IV-TR diagnoses with a prevalence of >5% are shown.

^bDue to comorbidity, percentages of DSM-IV-TR diagnoses do not add up to 100.

^cOther disorders usually first diagnosed in infancy, childhood, or adolescence are learning disorder (n = 2), reading disorder (n = 8), stuttering (n = 1), and expressive language disorder (n = 1).

^dOther disorders include schizophrenia or other psychotic disorder, mood disorders, anxiety disorders, impulse control disorders not otherwise classified, and adjustment disorders.

^eFor one boy the highest level of education was not known.

*p < 0.05.

tive behaviour disorder, affecting a higher proportion of the ADHD group (46%) than either the ASD (28%) or the ASD + ADHD (28%) groups (Fisher's exact test = 6.44; $p = 0.039$).

The highest level of educational attainment differed significantly between the three groups (Fisher's exact test = 17.34; $p = 0.044$). Compared to male adolescents with ADHD, more in the groups diagnosed with ASD or ASD + ADHD attended special secondary education. In special secondary education in the Netherlands, the school programme is adapted to the cognitive or psychiatric needs of the adolescents. There was also a difference in living conditions. More adolescents in the groups diagnosed with ASD and ASD + ADHD lived with both biological parents than was true of those with ADHD.

In the group of adolescents with ASD, 22% used medication, compared to 34% among those with ADHD and 62% among those with ASD + ADHD, a statistically significant difference.

3.2 | Predominance of type of delinquency

As shown in Table 2, violent property offences (33.3%) predominated among the group of adolescents with ASD, followed by moderate violent offences (30.4%) and sex offences (29.0%). In the group of adolescents with ADHD, the most common offences were violent property offences (37.8%), property offences without violence (24.4%) and moderate violent offences (21.1%). In the group of adolescents diagnosed with ASD + ADHD, moderate violent offences (27.6%) predominated. Table 2 shows that the rate of property offences without violence was significantly higher (Fisher's exact test = 10.50; $p = 0.004$) in adolescents with ADHD (24.4%) than in those with ASD (5.8%) and/or ASD + ADHD (17.2%). Significantly more adolescents with ASD, and ASD + ADHD, than those with ADHD were suspected of committing a sex offence (Fisher's exact test = 8.54; $p = 0.014$).

Thirty-four adolescents (18% of the ASD/ADHD sample) were suspected of one or more sexual offences. Twenty were diagnosed with ASD, 10 with ADHD and four with ASD + ADHD. Almost all of these offences had occurred with the alleged perpetrator acting alone ($N = 28$, 82%). Just three of the 20 alleged sex offenders with ASD but four of the 10 with ADHD had at least one co-offender at the time of the sex offence. Table 3 shows that, where sexual assault/rape victim age was known, most (20/32 known) were under age 16 and this did not differ by diagnostic group. Use of a weapon in the assault was very rare—just three cases—and only if ADHD had been diagnosed.

TABLE 2 Index offences of male adolescents with autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD) and ASD + ADHD*

Type of offences (van Kordelaar, 2002)	Total sample ($N = 188$)		ASD ($n = 69$)		ADHD ($n = 90$)		ASD + ADHD ($n = 29$)		Fisher's exact test	p -value
	n	%	n	%	n	%	n	%		
Violent property offence	63	33.5	23	33.3	34	37.8	6	20.7	2.832	0.237
Moderate violent offence	48	25.5	21	30.4	19	21.1	8	27.6	1.929	0.382
Sex offence	34	18.1	20	29	10	11.1	4	13.8	8.538	0.014
Property offence without violence	31	16.5	4	5.8	22	24.4	5	17.2	10.502	0.004
Serious violent offence	23	12.2	7	10.1	13	14.4	3	10.3	0.703	0.755
Manslaughter	13	6.9	3	4.3	8	8.9	2	6.9	1.247	0.535
Arson	10	5.3	2	2.9	6	6.7	2	6.9	1.437	0.604
Vandalism	7	3.7	2	2.9	3	3.3	2	6.9	1.269	0.669
Drug offence	4	2.1	1	1.4	2	2.2	1	3.4	0.881	0.653
Murder	3	1.6	1	1.4	1	1.1	1	3.4	1.368	0.553

Note: Because of the possibility of more than one index offence per adolescent, the percentages do not sum to 100.

Abbreviations: ADHD, attention deficit hyperactivity disorder; ASD, autism spectrum disorder.

TABLE 3 Characteristics of perpetrators of sex offences ($n = 34$)

Offence characteristics	Total sample of sex offences ($n = 34$)		ASD ($n = 20$)		ADHD ($n = 10$)		ASD + ADHD ($n = 4$)		Fisher's exact test	p -value
	n	%	n	%	n	%	n	%		
Sex offences conducted solo	28	82.4	18	90	6	60	4	100	4.059	0.121
Sex offences conducted in a group	7 ^a	20.6	3	15	4	40	-	-	3.012	0.200
Assault victim was <16	10	29.4	7	35	2	20	1	25	0.791	0.858
Assault victim was \geq 16	5	14.7	3	15	1	10	1	25	0.935	0.642
Rape victim was <12 years	10	29.4	7	35	1	10	2	50	2.988	0.189
Rape victim was \geq 12 years	7	20.6	3	15	3	30	1	25	1.359	0.485
Use of a weapon	3	8.8	-	-	2	20	1	25	5.214	0.081

Abbreviations: ADHD, attention deficit hyperactivity disorder; ASD, autism spectrum disorder.

^aThe number of sex offences conducted in a group and the number of sex offences conducted solo do not add up to 34 because one juvenile committed sex offences both ways.

4 | DISCUSSION

In a sample of young male alleged offenders, we examined relationships between the nature of the alleged index offence and the diagnoses of ASD and ADHD separately or in combination, as assessed by psychiatrists and psychologists. We found some differences in diagnosis-offence relationships. While there was no difference in distribution of violent offending by diagnostic group, sex offending was significantly more likely among those with the diagnosis ASD alone than a diagnosis of ADHD with or without ASD. By contrast, those with ADHD were more likely to be under a charge of non-violent property offending than those with ASD, alone or in combination. Among the adolescents in the study, differences were also found in comorbidity, education and living conditions. In the group of adolescents with diagnosis of ADHD alone, the level of completed education was lower, as well as the number of adolescents living with both biological parents.

Our finding that index sex offences were significantly more prevalent among the adolescents diagnosed with ASD fits with a likely impaired ability to understand social information among some people so diagnosed. Others have suggested that this may lead to misinterpreting somebody else's intentions and feelings and undesirable sexual behaviour being, in effect, impaired intimacy (Kohn, et al., 1998; 't Hart-Kerkhoffs et al., 2009). The study by 't Hart-Kerkhoffs et al. (2009) found that, among young sex offenders, lone peer offenders and child molesters got higher scores on several subscales and total scores on ASD measures than did boys who committed sex offences in groups. It is worth emphasising, however, that the sexual development of adolescents with ASD is not necessarily aberrant; Dewinter et al. (2015) showed a high level of similarity of sexual behaviours between non-delinquent adolescent boys with ASD and controls.

The finding of boys with ADHD being more likely to be involved in alleged non-violent property offences is in line with a study concerning the modulating effect of ADHD on the course of delinquency in young, incarcerated men (Philipp-Wiegmann, et al., 2017). Others have also noted a link between ADHD diagnosis and some types of conduct disorder (e.g. Goldstein et al., 2005). In our study, disruptive behaviour disorder is the most common comorbid disorder in the three groups, but the ADHD group manifests a significantly higher percentage of disruptive behaviour disorder than the ASD and ASD + ADHD groups. The suggestion that ADHD and comorbid conduct disorder increase the risk of delinquency in juveniles (Sibley et al., 2011), however, seems just another step in circularity. In our study, the ADHD group was more likely to live with only one biological parent and school attainment was lower. In the ADHD group, not more than one third of the total group used any medication.

4.1 | Study strength and limitations

A considerable strength of this study is the large sample size of 12-17-year-old alleged offenders with ASD and/or ADHD, as the cohort from which they were drawn was already highly selected, on the one hand by their criminal justice system involvement and on the other by specialist psychiatrist and/or psychologist involvement. Rules of such selection are broadly understandable but not always tightly defined. Variables influencing psychiatric referral similarly vary; in particular, it might be expected that the more serious and clear-cut cases of disorder would be referred (Vinkers & Duits, 2011). It must also be emphasised that none of the adolescents in our sample had been convicted of the index offence at the time of data collection, so it is possible that some did not commit the act as charged. Our sample is, therefore, unlikely to be representative all young offenders diagnosed with ASD or ADHD or both.

A possible clinical limitation is that we relied wholly on the clinical assessments for the courts, with the possibility of bias through clinical expectation of psychiatric explanations of the offending (Guarnera et al., 2017; Ludici et al., 2015; Neal & Brodsky, 2016; Zapf et al., 2018). However, our findings are in accordance with previous studies that did not have this limitation (Cheely et al., 2012; 't Hart-Kerkhoffs et al., 2009). Nevertheless, our study can be of interest because we investigated whether the alleged index offence among adolescents differs between those diagnosed with ASD, ADHD or ASD + ADHD.

A strength of this study is the carefully mapping of the offence types of which the adolescents are suspected of, who have been diagnosed with ASD, ADHD or both, including their background characteristics.

5 | CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Although all of the adolescents in our sample had a neurodivergent disorder considered to be likely to have some relevance to a specific probable criminal offence, it is important to emphasise that our sample was selected for ASD and/or ADHD diagnoses and that most people with such conditions do not offend. Our most important finding suggests some specificity in association between type of disorder and type of offence. While there was no difference in distribution of ASD and ADHD—separately or together - among those charged with a violent offence, ASD was significantly more likely to have been diagnosed among those charged with sexual offences and ADHD among those charged with non-violent property offences. Future research should focus on understanding the nature of the relationship between these disorders and offending. Our findings suggest different directions for further, more detailed assessment and intervention when adolescents with different psychiatric diagnoses offend. Focus on emotion recognition and its association with social interaction is especially likely to be important when ASD is diagnosed but focus on family and relevant educational areas for those diagnosed with ADHD.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The datasets analysed during the current study are not publicly available due to intellectual property rights. The research group conducted quality checks on the data during the project to check that they were complete, correct and consistent. The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

Prior to the start of the study, the Psychological Ethics Committee of Tilburg University approved the study (EC-2015.45).

ORCID

Alexa X. Rutten  <https://orcid.org/0000-0003-0874-5755>

Maaik Kempes  <https://orcid.org/0000-0002-7618-3478>

Ijla L. Bongers  <https://orcid.org/0000-0002-8961-5663>

Robert R. J. M. Vermeiren  <https://orcid.org/0000-0002-8673-2207>

Chijs van Nieuwenhuizen  <https://orcid.org/0000-0002-6684-1529>

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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