British Journal of Psychiatry (1986), **149**, 68–74

Psychiatric Disorders in Mildly and Severely Mentally Retarded Urban Children and Adolescents: Epidemiological Aspects

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A total of 149 children aged 13–17 years were examined. 83 were mildly and 66 severely mentally retarded. These children, especially the severely retarded ones, are representative of all mentally retarded children born in 1966–1970 and living in Göteborg, Sweden. 64% of the severely mentally retarded and 57% of the mildly mentally retarded children were suffering from a handicapping psychiatric condition. Autism-like 'psychotic behaviour' was common in the severely retarded. 0.2% of the total child population aged 13–17 years suffering from the combination of mental retardation and 'psychotic behaviour'. Epilepsy was associated with psychiatric abnormality, but Down's syndrome was generally not so associated.

Epidemiological studies of psychiatric disorders in mentally retarded children are scanty. Rutter *et al* (1970) performed a comprehensive study on the Isle of Wight in the 1960s and found the prevalence of behaviour problems—severe and mild—in children with mental retardation to be three or four times more common than in randomly selected children of a corresponding age-group. This is probably the only previous population-based study of psychiatric disorder in intellectually retarded children, and the findings are in need of corroboration. It is now almost 20 years old, was carried out in a typically rural area, and its total number of severely retarded children was small ($n=38$). Modern studies, especially from urban areas where psychiatric disorders are known to be more frequent than in rural settings, might well yield higher prevalence figures.

The present study, derived from a population-based series of 164 Swedish urban children with IQ <70 and born in the period 1966–1970, had the following aims: to establish prevalence figures for psychiatric disorder in mentally retarded children and adolescents; to analyse the particular kind of psychiatric disorder in individual children; to analyse the effect of the degree of mental retardation on the occurrence and quality of psychiatric disorder; and to assess the association between psychiatric disorders and the additional impairments of epilepsy and Down's syndrome.

Method

Definition of terms

In accordance with the World Health Organisation recommendation of 1968, mild mental retardation (MMR) was defined as an intellectual level in the tested IQ range of -3.3 to -2.0 standard deviation (SD) from the mean of 100 (SD = 15), i.e. as an IQ of 50–70. The Wechsler Intelligence Scale for Children or the Terman–Merrill test were used. Severe mental retardation (SMR) was diagnosed in cases with IQ <50.

All children showing a persistent (i.e. lasting longer than 1 month) psychiatric condition, handicapping to him or herself or to others, were diagnosed as suffering from a psychiatric disorder. Seven main psychiatric diagnostic categories were used:

(a) *psychotic behaviour* (Gillberg, 1983), including cases with: (i) infantile autism (DSM-III, 1980), (ii) schizophrenia (DSM-III, 1980), (iii) the triad of language and social impairment (Wing & Gould, 1979), excluding infantile autism and other classifiable childhood psychoses, (iv) severe impairments of social interactions, and (v) Asperger's syndrome (Wing, 1981)

(b) *depressive syndrome*, as defined by Spitzer *et al* (1975)

(c) *conduct disorder* in cases showing socially unacceptable behaviour, such as stealing, firesetting, or running away from home

(d) *emotional disorder* in cases where anxiety and fear without loss of reality-sense were the most incapacitating symptoms

(e) *psychosomatic disorder* in cases with abdominal pains, vomiting, diarrhoea, headache, and secondary enuresis or encopresis occurring in situations of psychic stress and without apparent physical cause

(f) *hyperkinetic disorder* in cases with generalised hyperkinesis (i.e. hyperkinetic behaviour in several different settings)

(g) *other psychiatric disorder* in cases which could not be included under any of the foregoing headings.

Some children were diagnosed according to more

TABLE I

Description of the mentally retarded series in the psychiatric follow-up study

	SMR	*MMR*
Number in original epidemiological study	73	91
Prevalence (%)	0.30	0.37
Dead at follow-up	4	0
Moved to another region	1	4
Refused to participate	2	4
Total attrition rate at psychiatric follow-up (dead excluded) (%)	3	8
Number in psychiatric follow-up study	66	83
Boy:girl ratio	38:28 (1.4:1)	54:29 (1.9:1)
Age range	13–17	13–17
Epilepsy: *n* (% in brackets)	18 (27)	8 (10)
Down's syndrome: *n* (% in brackets)	18 (27)	2 (2)

than one psychiatric diagnostic category. In such cases, a hierarchy was used in accordance with the order of listing given above. For example, if the child had been diagnosed as suffering from both an emotional disorder and a depressive syndrome, the latter was considered the main diagnosis.

All children on anti-epileptic medication because of 'epilepsy' or who had had at least one seizure in the 12 months preceding the psychiatric study were diagnosed as suffering from epilepsy.

Population investigated

The original population studied consisted of all children born in 1966–1970 living in Göteborg on the 31 December 1978—a total of 24 498 children. Gothenburg is an industrial city on the West Coast of Sweden with 450 000 inhabitants. Through screening and register searches (as described by Hagberg *et al;* 1981*a*, 1981*b*) 91 children with MMR and 73 children with SMR were found, corresponding to population frequencies of 0.37% and 0.30% respectively. The prevalence figure for SMR is considered a true one, whereas that obtained for MMR is a minimum one. The MMR category did not comprise only cases known to services for handicapped children, since 20% were ascertained by screening procedures in schools. We believe that the majority of clearly mentally retarded children with IQ < 70 in the studied age-group have been detected.

The children were examined during the spring of 1984, when they were 13–17 years-old. Details of the series examined are given in Table I.

TABLE II

Psychiatric disorders in cases with severe mental retardation

Disorder	*n(%)*	*% with epilepsy*	*% with Down's syndrome*	*Boy:girl ratio*
So severely retarded that rating of psychiatric state was not possible	7 11	57	29	1.3:1
No psychiatric disorder	17 26	0	53	0.9:1
Depressive syndrome	1 1.5	100	0	0:1
Emotional disorder	3 4.5	0	67	0.5:1
Conduct disorder	3 4.5	0	0	2:1
Psychosomatic disorder	2 3	0	50	2:0
Psychotic behaviour	33 50	39	12	2:1
Schizophrenia	1 1.5	0	0	1:0
Infantile autism	5 8	60	20	4:1
Triad of language and social impairment	18 27	33	11	2.6:1
Severe social impairment	9 14	44	11	1.3:1
Total with psychiatric disorders	42 64	33	17	1.6:1

https://doi.org/10.1192/bjp.149.1.68 Published online by Cambridge University Press

TABLE III
Psychiatric disorders in cases with mild mental retardation

Disorder	*n(%)*	*% with epilepsy*	*% with Down's syndrome*	*Boy:girl ratio*
No psychiatric disorder	36 43	8	6	1.1:1
Depressive syndrome	3 4	0	0	3:0
Emotional disorder	8 10	13	0	1.7:1
Conduct disorder	10 12	0	0	1.5:4
Psychosomatic disorder	3 4	0	0	0.5:1
Hyperactive disorder	9 11	22	0	3.5:1
Psychotic behaviour	12 14	17	0	5:1
Schizophrenia	1 1	0	0	1:0
Infantile autism	3 4	0		2:1
Triad of language and social impairment	5 6	40	0	4:1
Severe social impairment	2 2	0	0	2:0
Asperger's syndrome	1 1	0	0	1:0
Other disorders	2 2	0	0	2:0
Total with psychiatric disorder	47 57	11	0	2.9:1

Psychiatric diagnostic assessment

All children were seen individually, and assessed by at least one of three doctors who all had a minimum of six months' training in child psychiatry. Each doctor examined approximately 50 of the 149 children. The first author is a child psychiatrist with special training in the field of mental retardation, childhood psychoses, and child neurology; he first examined between three and six children, each in collaboration with the second or third author, until agreement regarding symptoms and ratings of psychiatric disorders was reached. One of the parents (usually the mother) was interviewed with a highly structured manual covering psychiatric symptomatology, social and family factors, developmental milestones, siblings' and parents' health, hereditary factors, important somatic disorders, and treatment given by other doctors. The child was observed (and interviewed whenever appropriate) for at least 40 minutes. All manuals, medical records, and interview questionnaires were reviewed by the first author, and comprehensive diagnoses formulated by him; the complete diagnostic evaluation battery is available on request.

For statistical comparison, chi square tests with Yates' correction were used.

Results

Children with severe mental retardation

The results for this group are summarised in Table II. About one in ten of the SMR children were so severely mentally handicapped, and hence their behavioural repertoire so limited, that it was impossible to make a psychiatric classification. Only about one quarter of the SMR children were considered clearly psychiatrically normal. Altogether, 64% of the group showed major psychiatric disorders. The disturbances grouped in the 'psychotic behaviour' category were by far the most common, affecting exactly half of all the SMR children, but only 15% of these children showed infantile autism; the remaining 85% were all severely psychiatrically disturbed, had problems in the fields of social relationships and language, and demonstrated deviant behaviour such as ritualism, resistance to change, self-destructiveness, and hyperactivity. More than half ($n=9$) this group with 'psychotic behaviour' were pervasively hyperactive, but because they all showed concomitant severe disturbances of social relatedness and language, they were not classified separately as suffering from 'hyperactive disorder'.

The calculated frequency for the combination of SMR plus 'psychotic behaviour' in the general population was 0.15% in the 13–17 year age-group.

All other psychiatric disorders were much less frequent in the SMR group, but it was possible to definitely diagnose disorders such as 'depressive syndrome' and 'conduct disorder' in a few children.

Children with mild mental retardation

In the MMR group (Table III) there were no psychiatrically unclassifiable cases, even though two boys (with

https://doi.org/10.1192/bjp.149.1.68 Published online by Cambridge University Press

disturbances of sexual behaviour) were referred to the 'other disorder' category. Slightly less than half the children were judged 'psychiatrically normal'.

Psychotic behaviour, conduct disorder, hyperactive disorder (without 'psychotic behaviour') and emotional disorder were all common, each category accounting for 10–14% of the whole MMR group. The boy with Asperger's syndrome also had periodic mania and depression, but showed no sign of such disorders at the time of the psychiatric study.

The frequency of 'psychotic behaviour' plus MMR in the general population was estimated at 0.05% in the 13–17 year age-group.

Epilepsy

In the SMR group 27% suffered from epilepsy. There were significant differences between the psychiatrically non-disturbed and disturbed groups with regard to epilepsy. In the former group none of the children had epilepsy, whereas in the latter fully one third, had a seizure disorder ($P<0.01$). Epilepsy was particularly common among children with psychotic behaviour.

In the MMR group 10% suffered from epilepsy. There were no clear-cut differences between psychiatrically normal and abnormal children in respect of epilepsy in this group. However, hyperactive disorders and psychotic behaviour tended to be associated with epilepsy slightly more than the other conditions (22% and 17% respectively in the two former categories, compared with 4% in other groups of psychiatrically disturbed children).

Down's syndrome

In the SMR group, Down's syndrome correlated significantly more strongly with 'psychiatric normality' than with 'psychiatric abnormality' ($P<0.02$). however, it is worth noting that one of the Down's syndrome children suffered from classic Kanner-type infantile autism. In the MMR group there were only two children with Down's syndrome, both of whom were judged to be 'psychiatrically normal'.

Sex ratios

There was a marked preponderance of boys in the MMR group (1.9:1), but in the SMR group the difference was less marked (1.4:1). Boy:girl ratios were close to population ratios in the groups of psychiatrically normal mentally retarded children (both SMR and MMR included). In marked contrast, the boy:girl ratios were raised in the psychiatrically deviant groups (MMR: $P<0.05$; SMR: not statistically significant), and especially in those showing either psychotic behaviour or hyperactive syndrome.

Discussion

This is possibly the first-ever systematic study of psychiatric disorders in a population-based series of both severely and mildly mentally retarded children. The results, therefore, must be considered to be of particular interest. In the Isle of Wight study (Rutter *et al*, 1970) 50% of the severely mentally retarded children were said to suffer from a 'psychiatric disorder', on the basis of interviews with parents and observations of the children, while a further 13% were too severely retarded to qualify for a rating of psychiatric state. The only recent epidemiological study of psychiatric disorders in severely mentally retarded urban children (0–15 years) is that of Corbett *et al* (1975), who suggested that a little less than half of the severely mentally retarded children in South-East London had 'behaviour disturbance', according to results obtained at psychiatric examination of the children.

Reid (1980) tried to apply the multiaxial classification scheme for psychiatric disorders in childhood and adolescence (Rutter *et al*, 1975) to a group of 41 mildly and 19 severely mentally retarded Scottish children who attended a special child psychiatric out-patient clinic for the mentally retarded. She concluded that it was quite feasible to diagnose psychiatric disorder in mentally retarded children using the same criteria as for children of normal intelligence.

The main finding of the present study—i.e. that a high proportion (more than half) of mentally retarded children have additional psychiatric handicap conditions—taken with the evidence from the British studies, has considerable clinical implications. Child psychiatric services of a wide variety must be provided for the affected children. In Sweden there are not at present enough services to take care of the multitude of problems of individuals and families that constitute the reality behind the crude figures of this report.

However, before drawing firm conclusions several issues need to be discussed. Firstly, is the population of children studied really representative of mentally retarded children, in Sweden or elsewhere? Hagberg *et al*. (1981*a*, 1981*b*), who carried out the earlier study of mental retardation, argued that the sample is indeed representative. Certainly the reported prevalence of 0.3% SMR in our study is similar to rates found by other researchers in Sweden (Gustavson *et al*, 1977; Gillberg *et al*, 1983) and the UK (Lewis, 1929; Goodman & Tizard, 1962; Rutter *et al*, 1970) and elsewhere (Tizard, 1966). Also, the rates of epilepsy and Down's syndrome in this group are typical of groups of severely mentally retarded children (Corbett, 1981). It is thus our contention that the SMR group is a representative one. The MMR group is more problematic; we are aware that our low frequency figure (0.37%) stands out as atypical

(compared with the expected value of 2.3%), and corresponds to a mean IQ of 110–112 in the general population. Terman-Merrill (1974) attribute this secular trend of increasing IQ to cultural factors (early stimulation). Furthermore, we know that a number of children with IQs close to the cut-off point of 70 have not been included (Gillberg *et al*, 1983). A child with an IQ of 72 at any particular time might well test below 70 at any other time. Prevailing attitudes of psychologists are of major importance in this respect; we know that in some ways the modes of application of the test methods have changed over the years. For instance, some psychologists interpret the test results in a more positive way than intended by the test manual, so that established IQ would tend to increase in the child population. Therefore, we consider our MMR group to be representative of all clearly mildly mentally children, but acknowledge the possibility that some children with IQs very close to 70 might have been missed. However, our frequencies for epilepsy and Down's syndrome are not different from those found in other studies of mentally retarded children (Rutter *et al*, 1970; Peckham, 1974).

Secondly, how reliable and valid were the psychiatric diagnoses? The first author alone made all the final diagnoses on the basis of the information elicited at the time of the psychiatric assessment. There was more than 95% agreement between the assessors after 3–6 cases of simultaneous assessment, indicating that this information was reliable.

The same kind of psychiatric classification was recently used in a study of six and seven year-old children with perceptual, motor, and attentional deficits (Gillberg, 1983). It was concluded that the psychiatric diagnoses were both reliable and valid; the total population rates for psychiatric disorders obtained were very similar to those found in other studies of urban young children. It is thus our contention that other psychiatrists would agree that 64% of SMR and 57% of MMR children in our study had truly deviant psychiatric states.

Thirdly, how far are the findings in respect of psychiatric disorders applicable to other groups of mentally retarded children? This is heavily dependent on whether or not the SMR and MMR groups are considered representative. Since an urban child population was studied, differences might appear when compared with results from non-urban populations. Rutter *et al* (1970) found 50% of SMR children on the Isle of Wight to have clear psychiatric abnormalities, and Corbett *et al.* (1975) found 43% of South-East London SMR children to be mentally ill. These findings, taken with ours, indicate that the frequency of psychiatric disorder in the SMR group is not likely to be heavily influenced by differences in the rural or urban nature of the environment. Also, the type of psychiatric problem—especially those grouped under the heading of 'psychotic behaviour'—and the frequent association with epilepsy indicate that brain dysfunction (malfunction rather than loss of function (Corbett, 1985)) is responsible for much of the high rate of psychiatric disorder. All the SMR children had signs of brain damage or dysfunction (Hagberg *et al*, 1981*b*).

The findings in respect of psycho-social problems have not yet been compiled, and conclusions must be drawn tentatively in this regard; this should not be taken to mean that psycho-social factors are of no importance. In the MMR group there are no sound epidemiological data with which comparisons can be made. In this group too, signs of brain damage or dysfunction occurred in more than half the cases (Hagberg *et al*, 1981*b*), although the kinds of psychiatric disorder are more akin to those seen in normally intelligent children, which might infer the importance of psycho-social factor in at least some of the cases. Since psycho-social diversity is the main reason for urban children having more psychiatric disturbance than rural children (Rutter, 1975), one might expect that in rural areas one would find a lower prevalence of child psychiatric disorder than our urban 57%

Fourthly, what do the diagnostic sub-categories imply? One half of the severely retarded and one seventh of the mildly retarded children showed 'psychotic behaviour', indicating the combination of disturbances of social relatedness, language, and behaviour seen typically in infantile autism. These proportions indicate that 0.2% of the total child population in the 13–17 age group show the combination of mental retardation and the triad of language and social impairment (Wing & Gould, 1979). This figure is the same as that found by Wing in her studies of handicapped children under 15 years old in Camberwell, South-East London. It indicates that 'autistic-like conditions' are much more common than autism, and will continue to cause problems of differential diagnosis. 'Pure' infantile autism occurs only in 10–20% of these conditions in this study and in a recent epidemiological study specifically aimed at finding autism cases in the same region (Gillberg, 1984).

All the children in the group showing 'psychotic behaviour' are in need of intense and continuous psychiatric care—some as long-term in-patients, others in the form of regular out-patient treatment or access to a specialised child psychiatric team. Many of the parents and siblings too are severely handicapped by the child's disorder—far more so

than parents and siblings of other mentally handicapped children. Special education, neuropharmacological expertise, social training programmes, family treatment (ranging from family therapy to regular contact and information), and sometimes supportive individual psychotherapy are essential features in the treatment repertoires that should be provided.

Among the children with other psychiatric disorders the degree of handicap tended to be more variable, but on the whole the psychiatric conditions were of a chronic or relapsing nature. According to medical records and other data about the children, they would have been diagnosed in the same or a similar category a year or more before the present study. This needs emphasising in view of the fact that many children in this study had reached puberty and it might be argued that the high rate of psychiatric disorder was due to this 'transient' phenomenon. It appeared that puberty sometimes tended to aggravate the problems, especially in the group with psychotic behaviour, but only rarely caused or precipitated them. However, there were three children (one with conduct disorder and two with psychotic behaviour) in the SMR group whose psychiatric problems had obviously begun at the onset of physical puberty.

A majority of the children with psychiatric disturbance had been seen for out- or in-patient psychiatric assessment during development. However, this also held true of children who were not suffering psychiatric disturbance or Down's syndrome with an IQ of around 20 or higher. Many mentally retarded children in Sweden, regardless of concomitant psychiatric disorder, are seen by child psychiatrists at an early age for assessment of their mental handicap. Child psychiatric consultation *per se*, as measured by registration at child and youth psychiatric services, is therefore not an indication of psychiatric disturbance in these children.

The degree to which epilepsy correlated with psychiatric disorder, especially in the SMR group, was striking. In this group all the epilepsy patients either were so severely retarded as to be considered unrateable in respect of psychiatric state or were suffering from some kind of psychiatric disorder. However, almost the opposite applied in the Down's syndrome group, where psychiatric disturbance was much rarer, though the stereotype that all such children are good-natured and without psychiatric problems was contradicted by the finding that four out of the 18 severely mentally retarded children with the syndrome in this study showed 'psychotic behaviour' (including one case of infantile autism).

Boys were more often affected by psychiatric disturbance than girls; this is in keeping with research on psychopathology among normal younger children (e.g. Rutter *et al*, 1970), but inconsistent with data from teenagers (e.g. Gillberg & Höök, 1977). The reason for the discrepancy is possibly the lower mental age in mental retardation, yielding groups which, from the developmental point of view, are comparable to pre-school and primary school age children.

This comprehensive epidemiological study of 13–17 year-old mentally retarded children in Göteborg has shown that between one half and two thirds of all such children have severe psychiatric disturbances. Differences in the frequency of psychiatric disorder between severe and mild mental retardation are small, even though there appear to be considerable differences in the nature of these disorders. In most cases the psychiatric conditions can readily be classified in terms similar to those used with children of normal intelligence, but in the severe mentally retarded group there is a sub-group in which classification is impossible. Long-term experience with mentally handicapped people is probably a prerequisite for arriving at an optimal psychiatric diagnosis. Much more effort and energy needs to go into the task of providing psychiatric services for mentally handicapped children and their parents.

Acknowledgement

We are grateful to Gun Jakobsson, who patiently typed the manuscript of this paper.

References

American Psychiatric Association (1980) *DSM-III. Diagnostic and Statistical Manual of Mental Disorders*, 3rd Ed. Washington DC: APA.

Corbett, J., Harris, R. & Robinson, R. (1975) Epilepsy. In *Mental Retardation and Developmental Disabilities:* (ed. J. Wortis), VII, New York: Brunner Mazel.

—— (1981) Epilepsy and mental retardation. In *Epilepsy and Psychiatry* (eds. E. J. Reynolds & M. R. Trimble), London: Churchill Livingstone.

—— (1985) Mental retardation: psychiatric aspects. In *Child and Adolescent Psychiatry, Modern Approaches* (eds. M. Rutter & L. Hersov), 2nd Ed., Oxford: Blackwell Scientific Publications.

GILLBERG, C. & HÖÖK, K. (1977) Child and youth psychiatric emergencies in Göteborg, Sweden, *Socialmedicinsk Tidskrift*, **7**, 401–408 (in Swedish).
——, C., SVENSON, B., CARLSTRÖM, G., RASMUSSEN, P. & WALDENSTRÖM, E. (1983) Mental retardation in Swedish urban children. Some epidemiological considerations. *Applied Research in Mental Retardation*, **4**, 207–218.
—— (1983) Perceptual, motor and attentional deficits in Swedish primary school-children. Some child psychiatric aspects. *Journal of Child Psychology and Psychiatry*, **24**, 377–403.
—— (1984) Infantile autism and other childhood psychoses in a Swedish urban region. Epidemiological aspects. *Journal of Child Psychology and Psychiatry*, **25**, 35–43.
GOODMAN, N. & TIZARD, J. (1962) Prevalence of imbecility and idiocy among children. *British Medical Journal*, 216–219.
GUSTAVSON, K–G., HAGBERG, B., HAGBERG, G. & SARS, K. (1977) Severe mental retardation in a Swedish county. I. Epidemiology, gestational age, birth weight and associated CNS handicaps in children born 1959–1970. *Acta Paediatrica Scandinavica*, **66**, 373–379.
HAGBERG, B., HAGBERG, G., LEWERTH, A. & LINDBERG, U. (1981*a*) Mild mental retardation in Swedish children. I. Prevalence. *Acta Paediatrica Scandinavica*, **70**, 441–444.
—— —— —— & —— (1981*b*) Mild mental retardation in Swedish school children. II. Etiologic and pathologic aspects. *Acta Paediatrica Scandinavica*, **70**, 445–452.
LEWIS, E. O. (1929) *Report of the mental deficiency committee, Part IV. Report of an investigation into the incidence of mental deficiency in 6 areas, 1925–1927*. London: HMSO.
PECKHAM, C. (1974) National child development study (1958 cohort). Personal communication.
REID, A. H. (1980) Psychiatric disorders in mentally handicapped children: a clinical and follow-up study. *Journal of Mental Deficiency Research*, **24**, 287–298.
RUTTER, M., GRAHAM, P. & YULE, W. (1970) A neuropsychiatric study in childhood. *Clinics in Developmental Medicine*. London: SIMP with Heinemann Medical.
—— (1975) Why are London children so disturbed? *Proceedings of the Royal Society of Medicine*, **66**, 1221–1225.
——, SHAFFER, D. & SHEPHERD, M. (1975) *A Multiaxial Classification of Child Psychiatric Disorders*. Oxford: Blackwell Scientific Publications.
——, TIZARD, J. & WHITMORE, K. (eds.) *Evaluating, Health and Behaviour*. London: Longmans.
SPITZER, R. L., ENDICOTT, J., ROBINS, E., KURIANSKY, J. & GURLAND, B. (1975) A preliminary report of the reliability of research diagnostic criteria. In *Predictability in Psychopharmacology: Preclinical and Clinical Correlations*. London: Raven Press.
TIZARD, J. (1966) Epidemiology of mental retardation. *International Journal of Psychiatry*, **2**, 131.
WING, L. & GOULD, J. (1979) Severe impairments of social interaction and associated abnormalities in children: epidemiology and classification. *Journal of Autism and Developmental Disorders*, **9**, 11–29.
—— (1981) Asperger's syndrome: a clinical account. *Psychological Medicine*, **11**, 115–129.

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(*Accepted 7 May 1985*)