Psychiatric Aspects of Hearing Impairments

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Hearing impairment is a multifaceted condition with medical, social and cultural aspects. Children with hearing impairments follow many different developmental pathways, some growing up to join the Deaf community. Children with fluctuating hearing impairments are at greater risk of behavioural problems and language and reading delay. Children with permanent hearing impairment experience the same range of mental health problems as hearing children but their presentation, treatment and outcome can differ because of differences in communication and language use.

**Keywords:** Hearing impairment, psychopathology, children, deafness.

**Abbreviations:** ACTeRS: Attention Deficit Disorder with Hyperactivity Comprehensive Rating Teacher Rating Scale; ADD-H: Attention Deficit Disorder with Hyperactivity; ANSER: Aggregate Neurobehavioural Student Health and Education Review; ASL: American Sign Language; BSL: British Sign Language; CAS: Child Assessment Schedule; CBCL: Child Behaviour Checklist; EEC: European Economic Community; LSF: Langue de Signe Francaise; OME: otitis media with effusion; PCL: Parents' Checklist; PRS: Conners' Parent Rating Scale; SEAI: Meadow Kendall Social-Emotional Inventory; TCL: Teachers' Checklist.

Introduction

Many children have hearing impairments but each child with a hearing impairment is unique. The term hearing impairment covers such a broad range of conditions that it is impossible to generalise about the psychiatric consequences of hearing impairment as a unitary phenomenon. Hearing impairment can be viewed as a medical condition and classified in a number of ways, but it can equally be considered as a social and cultural condition and understood from the perspective of the hearing impaired person (see Table 1). It is useful to think about hearing impairment as a multifaceted condition because a variety of factors will determine the effect of hearing impairment on children's development. Thus children who are born with bilateral, profound sensorineural deafness are likely to follow considerably different pathways from children who develop mild, fluctuating hearing impairments following acute otitis media. At the same time it is equally important to bear in mind how a child's growing awareness of his or her hearing impairment affects his/her development.

Although hearing impairment can be defined by a variety of different medical and audiological criteria, these definitions are not always coincident with the views of people with permanent hearing impairments, who often describe themselves in social or cultural terms. Socially and culturally determined definitions place emphasis on language use, educational experience and current social identification. Thus for culturally deaf people (Deaf people), deafness centres around the use of native sign languages (American Sign Language, ASL, in the U.S.A., British Sign Language, BSL, in Britain, Langue de Signe Francaise, LSF, in France, etc. [Kyle & Woll, 1985]), attendance at a school for deaf children and current involvement in Deaf organisations and an experience and understanding of the world in visual rather than auditory terms (Higgins, 1987).

In the main, members of this community will have prelingual or early onset sensorineural, severe to profound deafness, but some may have postlingual sensorineural deafness and some the hearing children of Deaf parents. Approximately 90% of these deaf children will have been born into hearing families (Rawlings & Jensema, 1977), the vast majority of these families having little or no experience of deafness. In contrast, people with hearing impairment of a lesser degree and those profoundly deaf people who use spoken language rather than sign language may use a variety of terms to describe themselves—deaf, hearing impaired, hard of hearing, etc. Their common identity is less defined by a particular language and culture and more by their active struggle to overcome the disability that arises from their condition and the stigmatising and handicapping attitudes that they encounter in society.

Research into the psychiatric aspects of hearing impairment is of importance in its own right in order to determine the mental health needs of deaf children and their families and the means of meeting these needs. Adaptations to assessment and treatment are of par-
children with fluctuating hearing impairments as a clearly members of the Deaf community. It will treat communication on family development. Impairment (which Deaf people themselves may not see cognitive and social/emotional development, the consequences for families of living with a child with a lifelong impairment (which Deaf people themselves may not see as an impairment) and the effects of impaired communication on family development.

This review is highly selective. It considers two groups of children who reflect the two extremes of hearing impairment: a large group of children with bilateral hearing impairment arising from the consequences of acute otitis media and a small group of children with permanent, severe and profound bilateral sensorineural deafness arising early in their development. These two groups of children do not represent all children with hearing impairment but they offer paradigms to explore the relationship between hearing impairment and mental health.

This review will use the terms deaf and hard of hearing in relation to children with permanent hearing impairment, using Deaf to refer to children and adults who are clearly members of the Deaf community. It will treat children with fluctuating hearing impairments as a distinct group from those children with permanent hearing impairment of whatever kind.

Psychiatric Aspects of Fluctuating Hearing Impairment

The Demography of Fluctuating Hearing Impairment

Acute otitis media is said to be the commonest reason for childhood consultation with general practitioners (Haggard & Hughes, 1991), with children in the first three years of life being at greatest risk. Acute otitis media can lead to the development of middle ear effusions (oticis media with effusion, or OME) and a variety of other middle ear conditions and so to hearing impairment. Some 10–30% of 2–7-year-olds have fluctuating hearing impairment arising from middle ear disease (Haggard & Hughes, 1991, p. 88) and children with OME represent the largest single group.

The cumulative incidence of OME over the third and fourth years of life is 65% (Zielhuis, Rach, van den Borsch & Van den Broek, 1990), and up to 90% of children are thought to have had OME at some time in their childhood (Tos, 1979). However, because of its fluctuating nature, changing incidence with age and difficulties in precise diagnosis, establishing age-specific prevalence figures has proven extremely difficult (see Haggard & Hughes, 1991, for a detailed discussion). In the first year of life, cumulative incidences of as high as 75% (Haggard & Hughes, 1991, p. 88) are reported and the prevalence in 2–7-year-olds lies in the range 10–30%. Of all children with OME, approximately 2–5% will require non-palliative treatment. The main risk factors associated with OME, apart from age, are: sibling history; race; season; type of daycare; early feeding practices; and parental smoking (Haggard & Hughes, 1991, p. 88). Boys are also at greater risk of developing both acute otitis media and OME. An association between these factors and carrier effects such as SEG makes it difficult to establish causal links between OME and its effects on children’s development. Haggard and Hughes suggest that these effects may partly be a consequence of the direct disease effects of OME and partly a consequence of hearing loss.

Developmental and Psychiatric Aspects

There have been a number of prospective studies of the effects of OME on children’s development. The most comprehensive is the Dunedin study, described in detail in Chalmers, Stewart, Silva and Mulvena (1989). The study used a combination of cross-sectional and longitudinal analyses to study the effect of OME on children’s intellectual development, expressive and receptive language, speech articulation and behaviour using a range of standardised measures at ages 3, 5, 7, 9 and 11. The sample contained 853 children with OME, confirmed at otological examination, and a control group.

Children with bilateral OME, with an onset before age 5, were significantly disadvantaged, with lower IQs (using the Stanford-Binet) at age 5 but not at age 3, significantly lower verbal comprehension and verbal expression scores at ages 3 and 5 (using Reynell Developmental Language Scales) and significantly higher behavioural scores (using Rutter A and B scales), presumably reflecting more
behavioural problems. The findings in relation to language development suggest that the OME may have been present prior to 3 years of age, with a significant effect on language development. However, differences in IQs (using the WISC) did not persist at ages 7 and 9, but differences in receptive and expressive language and speech articulation persisted until 9 years of age. Although parents of 5-year-olds reported significantly more behavioural problems than controls, this decreased steadily to age 11. In contrast, teacher ratings were consistently higher at ages 5, 7 and 9 (Chalmers et al., 1989). The Dunedin study also used observational methods in addition to teacher and parent reports of children's behaviour. The children with bilateral OME showed significantly greater observed dependency, short attention span and weak goal orientation (McGee, Silva & Stewart, 1982) and reported fidgetiness, restlessness, destructiveness, unpopularity and disobedience.

The long-term effects of bilateral OME on children's development have been used to support the case for early surgical intervention (Hughes & Wright, 1988). There are anecdotal accounts of significant and immediate improvements in children's behaviour following surgical treatment (Hughes & Wright, 1988; Jobson, 1985). However, no prospective study has been undertaken to date. There are clearly significant ethical and scientific difficulties associated with any such study, particularly in relation to the nontreatment control group. Haggard and Hughes (1991) point out that such a study would have to differentiate between the effects of the relief of illness effects and the effects of hearing loss, in order to shed light on the mechanisms involved.

Associations between inattentiveness, distractibility and OME have been found in a variety of studies (Feagans, Sanyal, Henderson, Collier & Appelbaum, 1987; Hageman & Falkenstein, 1987; Silva, Kirkland, Simpson, Stewart & Williams, 1982). Direct associations between diagnoses of ADD-H (DSM III/IIIR) and a significantly increased rate of ear infection have been found in two retrospective studies (Adesman, Altshuler, Lipkin & Walco, 1990; Hageman & Falkenstein, 1987). However, in the Adesman et al. study, this was with respect to middle ear disease in the preceding year rather than lifelong occurrence. Given that their group of children was aged 5–13 (mean 9.5), this study does not conform with the model of early effects of OME hypothesised by the Dunedin group.

**Permanent Hearing Impairment**

The Introduction to this review suggests that there are two potential communities of hearing impaired children: deaf or hard of hearing. However, to present the two potential communities in such a stark way denies the complexity and richness of both groups and their interrelationship. These social and cultural definitions of deafness are of great importance for psychiatry for two reasons. First, they give some clues to the current and future experience of the world for the child with a hearing impairment, who may become Deaf or Hard of Hearing and, in particular, they demonstrate the cultural transition that many deaf children will make from their Hearing families to the Deaf community as adults. Second, the first formal linguistic description of a sign language, Stokoe, Casterline and Cronenberg's (1965) ASL dictionary, led to a paradigmatic shift in both hearing and deaf people's views of deaf people and sign language. Prior to 1965, sign language had been seen not as a language but as a form of gestural communication, mixed with mime, which was incapable of conveying any meaning apart from the immediately concrete. This was consistent with the widely held view that deaf people were by definition primitive, concrete thinkers (Pollard, 1993), incapable of abstract thought. The ramifications of Stokoe, Casterline and Cronenberg's works were widespread. It led to the reintroduction of signing and deaf adults into schools in North America and Europe, from which they had been banned for nearly 70 years. It led to the re-evaluation of much of the work on the intellectual development of deaf people and the realisation that studies that had demonstrated the intellectual inferiority of deaf people had failed to take into account the inappropriateness of using verbal subtests, administered in spoken language, with deaf people (Vernon, 1967). It sparked an interest in the family context and early relationships between deaf children and their families (Schlesinger & Meadow, 1972) that has shaped and continues to shape our understanding of deaf children's social and psychological development. Finally, the controversy over teaching methods used with deaf children—oral/aural or sign—began to involve psychiatrists because of the mental health consequences of orally educated deaf children developing little or no useful spoken language (Conrad, 1979) and led to Roger Freeman's (1976) annotation in this journal on the controversy. In summary, the study of sign language led to people thinking about deaf children as different from hearing children rather than deficient.

Freeman's annotation raised a number of fundamental questions in relation to communication and deaf children, some of which have been addressed by research in the intervening 20 years. Communication and language will be important themes in this review but other aspects of deaf children's development are important in providing a context within which to review the research on psychiatric aspects of hearing impairment. They include the changing demography of deafness, the incidence of additional impairments, deaf children's intellectual and social development, the maltreatment of deaf children and recent changes in educational and medical practice. This review cannot provide an exhaustive survey of all these areas but consideration of them all is essential in considering deaf and hard of hearing children's mental health. Readers interested in more detailed accounts of deaf children's social and psychological development may be interested in texts such as Marschark (1993) and Marschark and Clark (1994), which provide comprehensive accounts. Braden (1994) provides a thorough account of the relationship between deafness and intelligence.

**The Demography of Deafness**

The most recent and comprehensive study of the prevalence of bilateral sensorineural deafness (Davis, Wood, Healy, Webb & Rowe, 1995) estimates that 1.2/1000 children per birth per annum have hearing losses of 40 dB or more. 1/2703 children per birth cohort
have profound losses of 95 dB or more. However, the authors point out that the prevalence varies year on year and according to area studied. The study found a changing pattern in the aetiology of childhood deafness, with fewer children becoming deaf as a result of congenital rubella and more as a consequence of extreme prematurity and more with a family history of deafness, when compared with a study carried out in the EEC almost 20 years ago (Martin, 1982). However, the proportion of children deafened as a result of meningitis remained the same. Although, anecdotally, there are said to be more deaf boys than deaf girls, neither Davis et al. (1995) nor McCormick (1993) specifically mention gender differences.

This changing pattern of aetiology should have had important implications for rates of psychiatric disorder. Vernon (1982) reported that children who were deaf as a result of prematurity or Rhesus incompatibility were at particular risk of cerebral palsy, mental retardation, visual impairments and seizure disorders. Freeman, Malkin and Hastings (1975) report a prevalence rate of 16% for brain abnormalities, on the basis of the presence of "hard signs". However, Sinkkonen (1994) found that 22.4% of all Finnish deaf and hard of hearing children and young people aged 5–21 had an additional impairment, of whom 6.9% had intellectual impairments, 6.6% motor impairments, 10.3% visual and 10.6% other. Thus the changing pattern of aetiology does not appear to have resulted in a higher prevalence of additional impairments.

There have been three other changes in the demography of deafness in the last 10 years. The first is the growing recognition of Deaf people as bilingual and bicultural (Grosjean, 1992). This has led to a culture change in many educational programmes for deaf children, with Deaf adults assuming vital roles both as sign language teachers and as cultural role models, smoothing the path by which deaf children become Deaf adults. The second change is the growing number of deaf children from ethnic minority backgrounds in the U.K., U.S.A. and other developed countries. There is growing recognition of the additional educational difficulties that these children face (Cohen, Fischgrund & Redding, 1990) and of the efforts that educators must make to bridge the three cultures and languages in these children's lives: those of the Deaf community, their families and the majority hearing world. Finally, in many countries, a majority of deaf children are now being educated in units attached to mainstream schools or they are fully integrated (Ross, 1990). The experiences of these children and their parents are varied, some appearing to enjoy and benefit from being in mainstream schools whereas for others the experience is aversive (Gregory, Bishop & Sheldon, 1995, pp. 59–70).

Family Response and Adaptation to Deafness

The responses of parents to the ascertainment of deafness and their adaptation to their deaf child will vary according to a variety of different factors. First amongst these is how deafness is construed within society. Gregory (1991) points out that the model of disability presented in popular literature tends to present disabled children as in need of charity and pity and parents as manifesting unremitting bravery and devotion to their children. From the time when their child's deafness is confirmed, images of disability and attitudes towards disabled children confirm that having a deaf child is a tragedy. As a result the most prevalent model used to explain parental response is that of crisis/adaptation, in which the confirmation of deafness is understood as provoking feelings of loss which have been compared with bereavement (Danek, 1988). Parental emotional adaptation is then described in a series of stages—shock, denial, grief, projection of grief as anger or guilt, realisation and acceptance (Bicknell, 1983). Both Gregory (1991) and Koester and Meadow-Orlans (1990) point out that it is misleading to expect that all parents will respond in this way and that deaf parents particularly may actively welcome the birth of a deaf child.

A substantial proportion of parents will suspect that their child is deaf and many early detection programmes now use parental suspicion as a central component (Hall, Hill & Elliman, 1990). This suspicion, and professional responses to parental suspicion, may help to prepare parents. However, for the majority of parents the moment of confirmation is recalled as an emotionally overwhelming event, often for many years on, although for parents whose suspicions have been denied by clinicians the confirmation may provide initial relief (Gregory, 1991). Danek (1988) suggests that events leading up to the diagnosis, such as the response of clinicians and the manner in which the news is broken, will influence how parents respond. In addition she suggests a number of moderating family factors that will influence the outcome of parental adaptation. These include the cognitive capacity of the parents, their social support, physical health, their history of successful coping, an optimistic outlook on life, a sense of mastery and a broad range of life and parenting skills. This is a broad-brush approach to parental adaptation, and other studies have identified factors more specific to deafness itself and have begun to identify factors specific to the child, the family and their broader social context.

Factors Specific to the Deaf Child

The most striking impact of deafness is on communication, and in particular the deaf child's reliance on visual means of communication and lack of access to auditory communication. Marschark (1993, pp. 39–40) has speculated that lack of intrauterine auditory interaction between congenitally deaf children and their mothers might influence attachment formation. Studies of early infant–mother interaction confirm that there are differences in the way that deaf and hearing infants interact with their deaf and hearing mothers. Using Cohn and Tronick's (1983) Still Face Paradigm, in which the infant is placed under stress when its mother adopts a face devoid of emotion, Meadow-Orlans et al. (1987b) found that Deaf mothers were more likely to use positive facial affect than hearing mothers in their interactions with their Deaf infants of 14–16 weeks. In turn, Deaf infants were more likely to show neutral attend behaviours when interacting with their Deaf mothers. In another study of 12–24-week-old deaf and hearing infants of Deaf and hearing mothers, Meadow-Orlans, MacTurk, Prezioso,
Ering and Day (1987a) again found greater use of positive facial affect by Deaf mothers and concluded that they were substituting positive facial affect for the positive vocal tone so often used by hearing parents, and that the deaf infants’ neutral affect enabled the infants to assimilate visual information more easily.

Reliance on visual channels of communication presents parents with a fundamental difficulty in their task of facilitating language development. That is: How can a parent or carer present a deaf child with a sign or lip pattern that is salient to the child’s activity without disrupting their visual attention? This problem of “divided attention” was first described by Wood, Wood, Griffiths and Howarth (1986). Studies of Deaf mothers with Deaf infants have shown that they are able to minimise the problem by altering sign locations, carefully waiting until they have their child’s visual attention before signing and bringing relevant objects into their child’s visual field (M. Harris, 1992).

These studies point to some of the pragmatic differences in the interactions between deaf infants and their carers when compared to hearing infants. However, Koester and Meadow-Orlans (1990) point out that the feelings of sadness and depression that may follow the confirmation of deafness will also interfere with the interaction between the mother and the infant. They cite Erting (1982), who asserts that these feelings may be particularly marked because hearing people regard hearing and talking as central to their sense of self and so to their expectations of their child and their developing relationship.

Difficulties in communication continue to affect relationships as deaf children develop. In a longitudinal study of 41 deaf toddlers (mean age 22 months) and matched hearing controls, the deaf toddlers were less likely to communicate with their mothers, who were less likely to understand their toddlers’ communication (Lederberg & Mobley, 1990). The same study found that the deaf toddlers were less likely to spend time in free play with their mothers.

Coping Processes and Coping Resources: In Preschool-age Deaf Children, their Families and Social Contexts

Danek (1988) and Koester and Meadow-Orlans (1990) have suggested that the single most important coping resource for mothers of deaf children is their social support network. This has been seen as an important factor, a “buffer” in moderating the effects of stresses associated with parenting a deaf child. Quittner, Glueckauf and Jackson’s (1990) study of 96 hearing mothers of deaf infants and 118 hearing controls challenges this view, suggesting that social support may in fact act as a mediating factor.

All the deaf children in the study had mean hearing losses of 70 dB or more; their mean age was 48 months. No significant differences were found between the deaf and hearing control groups on demographic variables such as income, marital status, maternal age and education. Amongst other hypotheses, Quittner et al. investigated the hypothesis that the presence of a deaf child in the family might have an effect on the responsiveness of the parents’ social support networks. Quittner et al. used a variety of standardised instruments to look at different sources of parenting stress: the Parenting Stress Index (Abidin, 1983); the Eyberg Child Behaviour Inventory (Eyberg & Ross, 1978); and they developed a structured interview to elicit stresses directly related to parenting a deaf child, deriving two scales—the Family Stress Scale and the Parenting Routines Inventory—Stress Scale. They used three different instruments to measure social support: the Norbeck Social Support Questionnaire (Norbeck, Lindsey & Carriera, 1983); the Arizona Social Support Interview Schedule (Barrera, 1981) and the Revised Kaplan Scale (Kaplan, 1977). Finally, two instruments were used to measure maternal psychological distress: the Centre for Epidemiological Studies Depression Scale (Radloff, 1977) and the Symptom Checklist–90 Revised (Derogatis & Cleary, 1977). All the instruments used showed good internal consistency and test–retest reliability. The authors then used two different statistical methods to determine whether social support and perceived support operated as moderating or mediating factors in stress situations.

Using multiple regression analyses, neither extent of the social support network nor perceived support (seen by many as the crucial factor) emerged as significant moderating factors. The role of social support as a mediating factor was investigated using path analysis. A strong direct effect was seen between Child Stressors and Psychological Distress ($r = .54$), with child-related stressors accounting for 29% of the variance in the distress scores, but increased child-related stressors were also associated with lowered perceptions of social support and increased symptoms of distress. The extent of the mothers’ social network also emerged as a mediating factor between maternal stressors and psychological distress. In a combined model, mothers who had lowered perceptions of their competence as parents and were less attached to and rewarded by their children had smaller social networks, fewer social contacts and saw themselves as less admired and cared for. This was in turn associated with higher levels of psychological distress. Post hoc analyses of specific stressors suggested that difficulties relating to mothers’ parenting role, e.g. bedtime routines and managing their children’s behaviour in public, were particularly powerful in mediating maternal distress. Finally, examination of the sources of support for mothers of deaf children confirmed Greenberg, Calderon and Kusche’s (1984) finding that professional networks are of greater significance for them than for mothers of hearing children.

Quittner et al. conclude that social support networks may have different functions for chronic conditions as opposed to acute crises. For chronic conditions, support and advice offered by relatives and friends may be perceived as unhelpful and critical by mothers and, with time, members of their support network may drift away.

Deaf Preschoolers’ Play

Spencer and Deyo (1993, p. 73) summarise research on the differences in the development of play in deaf children. They identify three areas of difference: deaf children appear more likely to engage in solitary play; show
decreased use of object substitution or imaginary objects; and show less play despite having basic play competence.

Their small study of three groups (D: H—aural/oral communication; D: D—ASL or Signed English; H: H—English) showed correlations between language development and time on ordered sequences of play, and similar but weaker effects on mean time in planned or object substitution. They showed no difference in amount of time in symbolic play but children with less well-developed language used less sophisticated symbolic play. They conclude that “Deafness without delayed language did not result in lower levels of play behaviours” (p. 80).

Children with well-developed language may be advantaged in a number of ways: more practised at producing ordered linguistic symbols and so at producing ordered play, using linguistic symbols as mediators; finally, language may facilitate the transmission of culturally accepted patterns of behaviour.

Psychiatric Aspects of Permanent Hearing Impairment

Assessment

The psychiatric assessment of deaf children poses problems relating to language use and language proficiency—both of the child and, more importantly, of the clinician. In a small-scale study (N = 12) using the Child Assessment Schedule (Hodges, 1987), Hindley, Hill and Bond (1993) found that a child psychiatrist with limited signing skills was less likely to pick up affective symptoms of deaf children than when the psychiatrist worked with a skilled BSL interpreter. When Hindley et al. reviewed the interaction of the clinician and one particular child during the interview, it appeared that the clinician’s aim was to establish communication with the child at any cost. In doing so the clinician prevented the child from disclosing painful emotions and thoughts. In the same study a Deaf research worker was used as a comparison, but his previous experience and training in mental health was limited and he failed to establish any psychiatric diagnoses. A replication of this study with appropriately trained Deaf mental workers would be useful because, intuitively, it seems far more likely that deaf children would disclose to a Deaf clinician.

Although there has been no research in the last 10 years on psychiatric assessments of hard-of-hearing children, it seems likely that the assessment of hard-of-hearing children with limited or no spoken language would be even more difficult than that of deaf children (Jenkins & Chess, 1991; Kennedy, 1992).

Two recent textbooks provide overviews of hearing impairment. Jenkins and Chess (1991) suggest that sensory impairment can confound clinicians and, in particular, can be mistaken for mental retardation. They list a number of attitudes and beliefs that they believe help the clinician in making accurate assessments: professionals should not apply preconceived models of personality development drawn from able-bodied children; they should be knowledgeable about child development; they should avoid a deficit model suggesting that sensory impairment will inevitably result in psychological impairment; and they should always consider how the child’s sensory impairment interacts with their development and their environment (Jenkins & Chess, 1991, p. 529). They emphasise the importance of establishing communication with the deaf child and highlight the confusion that can arise if the clinician makes extensive use of idiomatic language. They suggest that, even if a clinician uses an interpreter when seeing a Deaf child, they should also have some signing skills.

Hindley and Brown (1994) bring similar beliefs, providing a more comprehensive account of the cultural view of deafness and the developmental process. They point out that the clinician’s communication skills influence all aspects of assessment (psychiatric, psychological etc.) and that involving a sign language interpreter requires careful planning and close cooperation between the interpreter and the clinician.

Prevalence

A range of studies into the prevalence of psychiatric disorder in deaf and hard-of-hearing children were conducted during the 1970s and 1980s; these are reviewed by Hindley and Brown (1994), who point out that the range of populations studied and the variety of methods used result in estimates of the prevalence of psychiatric disorder. For deaf children these estimates range from 15.4% (Rutter, Graham & Yule, 1970) to 54% (Fundudis, Kolvin & Garside, 1979), and for hard-of-hearing children 16.7% (Aplin, 1987), 28% (Fundudis et al., 1979). Deaf children were predominantly described as having behaviour disorders, with a relative lack of emotional disorders.

All of these studies used questionnaires that had not been validated in deaf populations and although some used parental questionnaires none included interviews with the children. The lack of an interview alone has been cited as one of the main reasons why affective disorders have been under-reported in studies of deaf children (Hindley, Hill, McGuigan & Kitson, 1994). These authors also cast doubt on the use of unvalidated screening instruments in deaf children because of linguistic and cultural differences. These factors are of particular importance in the use of clinical interviews with deaf children and young people (see earlier).

Hindley et al. (1994) developed psychiatric screening instruments specifically for deaf children and adolescents (the Teachers’ Checklist, TCL, and Parents’ Checklist, PCL) and piloted them in a group of deaf children (N = 62) attending a residential school for deaf children. Total scores on the TCL and PCL correlated well with the Rutter B and A scales respectively (r = .91 and .94). Both scales had good test–retest reliability (TCL, r = .74; PCL, r = .88). When the two instruments were used in combination as screening instruments, a cut-off point of 15 or more on either the TCL or PCL produced a false negative rate of 18% and a false positive rate of 29%.

The TCL and PCL were then used as screening instruments in a prevalence study of a group of deaf and hard-of-hearing children attending Hearing Impaired Units and a school for deaf children in the London area. In this study, 81 out of 93 children (87%) took part. The screening process identified two groups of children, one likely to have psychiatric disorder (called screened posi-
Children from the deaf school were interviewed with a highly structured interview, the CAS (Child Assessment Schedule) and P-CAS (Parents-CAS) ( Hodges, 1987). Children from the deaf school were interviewed with a BSL interpreter who had taken part in an initial pilot study (Hindley et al., 1993), and DSM-III-R (American Psychiatric Association, 1987) diagnoses were made using a computer program. Clinical judgements of case type were made on information from the interviews combined with teachers’ questionnaires.

The results of the study showed that the children experienced a wide range of emotional and conduct disorders. Anxiety disorders were the largest single group of problems but there were only two children with depressive disorders. No children were diagnosed as having ADD-H but there were six children with ADD without hyperactivity, two in the school for deaf children and the remainder in the Hearing Impaired Units (Hindley, 1993, pp. 68–69).

The adjusted prevalence was calculated by adding the total number of children identified as having definite or probable psychiatric disorders (A) to the number of children not interviewed (B) multiplied by the false negative rate of the interview (Y) [estimated prevalence = A + (B x Y)]. The estimated prevalence was expressed as a range, the lower limit being the number of children identified at interview and the higher limit being the adjusted prevalence. For the total group, estimated prevalence lay in the range 43–50.3%, for the children in Hearing Impaired Units this was 57–60.9% and for the children attending the deaf school, 33–42.4%. The difference in prevalence between the children attending the Hearing Impaired Units and the deaf school was not statistically significant.

A variety of demographic, medical and educational factors were investigated as possible aetiological factors. Factors such as social deprivation, degree of deafness and communication ability (as rated by teachers) were not significantly associated with psychiatric disorder. A number of subscales drawn from the CAS were associated with psychiatric disorders—Family, Friends, Self-Image and School. There were significant differences between the Hearing Impaired Unit and deaf school groups on the Self-Image and School subscales (Hindley, 1993, p. 74), suggesting that children in the deaf school had a better self-image and better school experiences than the children in the Hearing Impaired Unit. During the interviews with the children in the Hearing Impaired Units they made reference to frequent experiences of bullying. A more recent study of deaf children in integrated settings appears to confirm that they are at greater risk of being bullied and being bullies than are hearing children, and they have fewer friends than hearing children (Smith & Sharp, 1994, pp. 223–224). Smith and Sharp also found that children with special educational needs were more likely to be bullied about their disability, a factor which may in part explain the differences in self-image found by Hindley (1993).

Hindley et al.'s study can be criticised on a number of grounds. Their screening instrument had been piloted in a homogeneous group of deaf children and did not appear to function as well in their more heterogeneous group. The interviewing of the children with an interpreter was best practice at the time but is likely to be surpassed by a suitably trained Deaf clinician. The interviewing of children in the two groups was not completely comparable—more deaf children in the screened positive group were interviewed than in the Hearing Impaired Unit group. Finally, some of the measures used as possible aetiological factors were relatively crude, e.g. teacher ratings of communication ability. Nevertheless, the study provides interesting directions for future possible research and demonstrated that when the children themselves are interviewed they report as many emotional problems as hearing children, although the balance (more anxiety disorders and fewer depressive disorders) may be slightly different.

The other major prevalence study in the last 10 years is a total population study of deaf and hard-of-hearing children in Finland and a comparison group of hearing children and young people (Sinkkonen, 1994). Sinkkonen used modified Rutter B (2) scales to screen all hearing-impaired children and young people aged 6–21 years. Out of a possible 445 pupils, Sinkkonen received completed questionnaires for 416 subjects. In addition to sociodemographic information, Sinkkonen also collected data on the rates of additional impairment (see earlier), children and parents’ language use (sign only, speech and sign, speech only) and the children's communicative ability. Sinkkonen's modified Rutter scale allowed him to collect data on children's ego strength. In addition to the survey data Sinkkonen provided a comprehensive summary of the literature on deaf children's psychological development, particularly from a psychodynamic perspective.

The two most striking findings from Sinkkonen’s study relate to the prevalence of psychiatric disorder and communication. Sinkkonen (1994, pp. 60, 66) found no significant difference in the rate of psychiatric disorder amongst the deaf children compared with hearing controls (18.7% vs. 15.8%). Low communication ability amongst children with multiple handicaps was significantly associated with psychiatric disorder (p. 61). Low communication ability in children with hearing impairment only was associated with high scores on the Rutter B hyperactivity scale. Sinkkonen (1994, p. 95) found that all of the hearing mothers and 94% of the fathers, who took part in the survey, had some signing skills. It seems likely that effective communication within the family, and associated changes in attitudes towards deaf children, account for the low prevalence of psychiatric disorder.

Two recent studies used screening instruments and clinical interviews with deaf children and young people that had not been validated for this population. Van Eldik (1994) used the Child Behaviour Checklist (CBCL—Achenbach & Edelbrock, 1983) to survey all boys in Dutch day schools of deaf children, aged 6–11, who had been referred to mental health services, and compared them with a “normal hearing” group. Van Eldik obtained permission for 45 out of a total of 100 children to take part in the study and obtained complete data on 41 of these boys. One boy was excluded because his parents were not Dutch and three others because they had been referred to the mental health services. His
Deaf boys were more likely to have higher scores on the internalising and externalising subscales of the CBCL, but again there were no significant differences when a clinical cut-off was used. Within the deaf group, younger children were more likely to experience clinically significant behaviour problems. There were similar trends for children with predominantly low frequency losses and children from low SES families, but these did not reach statistical significance. Ratings of communication level, ordinal position within the family, parental rating of communication and IQ (there is no explanation of how this was established) were not related to behaviour disturbance. In this discussion, van Eldik includes the three children referred to the mental health service to calculate a prevalence of "disturbance".

Van Eldik's paper is interesting because it offers the opportunity to compare behaviour ratings between a population of deaf and hearing children. However, there are a number of fundamental flaws. First, the members of his comparison group were not rated simultaneously but were drawn from an earlier study, and it is unclear whether or not this comparison group was a true general population group (i.e. including children with mental health problems) or a similarly constructed group that excluded these children. Second, van Eldik's estimate of disturbance uses two distinct criteria of disturbance, referral to mental health service and CBCL score above the 90th centile cut-off, to calculate a prevalence of "disturbance". Finally, no explanation is offered as to how a number of ratings used in the study (IQ, parental SES, communication level) were obtained.

The CBCL has more recently been used to estimate the prevalence of disorder in a group of Deaf children attending a primary school (N = 42) and a secondary school (N = 57) for Deaf children in the West Midlands in the U.K. (Vostanis, Hayes, du Feu & Warren, submitted). The CBCL and PCL (see earlier) were administered to 84 out of 99 parents (85%). Data concerning sex, age, ethnic group and child and parent's method of communication were also collected.

In this study, 52 (62 %) of the children were of Asian origin, and Asian language interpreters were present when the CBCL and PCL were completed by the children's mothers. All the children used BSL. Using the CBCL, 29 (39.7 %) of the children fell in the clinical range against 60 (76.9 %) when the PCL was used, with a cut-off point of 15. However, it should be pointed out that the PCL was designed to be used in conjunction with the TCL, and published psychometric properties relate to this combination of screening instruments (Hindley et al., 1994). Eighteen children (24.6 %) were within the clinical range using the Internalising subscale of the CBCL, and 22 (30 %) using the Externalising subscale. Using the Social Competence subscale, 55 (82 %) of the children were said to be dysfunctional.

Although the CBCL and PCL had different detection rates, there was a high degree of agreement on the severity of emotional and behavioural problems and both scales had good internal reliability.

Vostanis et al. (submitted) found correlations between communication method, ethnicity and psychopathology. Children who used BSL alone (without any spoken language) were more likely to be rated as cases using the CBCL and this reached statistical significance in the Secondary school (X^2 (1) = 6.6, p = .01) although not with PCL. Children from Asian families were more likely to be rated as cases on the PCL than were the white children (X^2 (2) = 8.8, p = .01), but this was not so with the CBCL. The authors speculate that the higher rates of problem behaviour amongst the children who use BSL alone might be because the children with oral language could have access to protective relationships at home. Conversely, the higher rates of problem behaviour in children from Asian families might be a consequence of being exposed to a third language at home or of differing cultural attitudes towards disability and mental health.

Vostanis et al.'s findings in relation to communication echo those of Hindley et al. (1994) in that, although the hard-of-hearing children had a higher rate of psychiatric disorder, they reported more positive family relationships. However, neither study uses a genuinely robust measure of communication. Research into mother–child, child–sibling and peer relationships (see earlier) shows how difficult it is to measure communication (cf. Lederberg's finding that parents were able to discuss set topics with their deaf children but that the quality of communication rapidly deteriorated when they were asked to engage in open discussion of holiday plans). None of the studies of psychiatric disorders in deaf children has used a direct observation of child–parent communication, or a direct measure of the child's communicative competence. Equally, children's communicative competence has been rated by either parent's or teachers, neither of whom, in the vast majority of cases, have sign language as their first language. Although Hindley et al. (1994) suggested that using a hearing child psychiatrist with a sign language interpreter was the best possible practice at the time, it is intuitively more appropriate to use a clinician whose first language is sign language and who is Deaf. Given the contradiction in findings in relation to school setting and the weaknesses outlined earlier there is a clear need for a large-scale study to investigate these areas.

Deafness and Specific Disorders

Given the profound impact that deafness has on children's psychological development and on the task facing mental health professionals, it is worthwhile to examine research into specific areas of disorder and their presentation in deaf children.

Deafness and Attention Deficit Disorder

A number of studies have suggested that deaf children show greater degrees of impulsivity than hearing children (R. I. Harris, 1978; O'Brien, 1987), and Greenberg and Kusche (1993) have identified impulse control as one of the cognitive interpersonal skills that many deaf children
lack. Greater impulsivity has also been noted in children with deafness as a resulting from congenital rubella with additional impairments (Chess & Fernandez, 1980), and generalised brain abnormalities associated with some cause of deafness have been cited as one cause. Greenberg and Kusché (1988) have suggested that distortions of early communication environments and their effects on the development of affect regulation and other interpersonal problem-solving skills may also account for these differences. Could this background of greater impulsivity confound the assessment of ADD or lead to higher rates of ADD amongst deaf children?

There are a number of factors that may lead to a misdiagnosis of ADD: misattributing problems of communication; different perceptions of behavioural or learning style (in particular deaf children’s reliance on visual cues); medical conditions such as seizure disorders; subtle processing disorders; and inappropriate school placements (Kelly, Forney, Parker-Fisher & Jones, 1993a), apart from other psychiatric disorders such as anxiety or depression. These difficulties may be particularly marked in families with limited communication skills, in which parents may feel overwhelmed and rely more heavily on physical punishment (Jenkins & Chess, 1991). Kelly et al. (1993a) describe a comprehensive programme for evaluating deaf children who are thought to have ADD, including consultation with parents and school staff, direct observation of the child and detailed medical and psychological examination.

Their study of ADD in deaf children (Kelly et al., 1993b) is the only published study that has used standardised instruments to estimate the prevalence of ADD in this population. They used the Conners’ Parent Rating Scale (PRS), completed by house parents (Goyette, Conners & Ulrich, 1978), the Attention Deficit Disorder with Hyperactivity Comprehensive Rating Teacher Rating Scale (ACTeRS) (Ullman, Sleator & Sprague, 1984) and the Aggregate Neurobehavioural Student Health and Education Review (ANSeR) System Questionnaires (Levine, 1987); the latter two scales were completed by teachers. The children studied were 238 out of 254 students at a residential school for deaf children. They were aged 4–21 years with a mean age of 16; the authors also grouped the children according to the aetiology of deafness.

There were significant correlations between the different hyperactivity factors of all three scales. The mean scores on three subscales of the PRS (Learning Problem factor, Impulsive-Hyperactive factor and Hyperactivity index) were compared with hearing norms. There were no differences with hearing norms for deaf girls and deaf boys; scores were significantly lower than hearing norms on the Impulsive-Hyperactive factor and the Hyperactivity index.

There was no association between the Attention and Hyperactivity factors of the ACTeRS and the age, sex, degree of hearing loss or use of hearing aids. However, significant associations were noted between these factors and aetiology of deafness. The mean scores of children with acquired deafness were significantly higher than those of children with hereditary deafness on the Learning Problem factor (acquired: 0.68, hereditary: 0.34, t = 3.18, p = .002) and significantly lower, and so indicative of greater disturbance, on the ACTeRS subscale Attention factor (acquired: 39.6, hereditary: 49.4, t = 2.18, p = .031).

Using a clinical cut-off of the bottom 20th centile for the ACTeRS, 38.7% of the acquired group against 14% of the hereditary group had clinically significant problems (p = .002). This finding was replicated with the PRS Learning Problem factor but not with the Impulsive-Hyperactive factor or the Hyperactivity index.

Kelly et al. conclude that deaf children with hereditary deafness are not at greater risk of developing ADD but that children with acquired deafness are, and that this difference is most probably accounted for by generalised brain abnormalities associated with congenital rubella, congenital cytomegalovirus and bacterial meningitis. However, they note that hereditary deafness in the presence of a family history is more likely to lead to early intervention in including appropriate communication. It may also be noteworthy that the hereditary group are also more likely to contain the Deaf children of Deaf parents, whose developmental pathway is not affected by communication differences.

These findings and further study of the development of impulse control in deaf children may be of help in clarifying the neuropsychological processes that underpin ADD in hearing children.

**Affective Disorders in Deaf Children**

Assessment of affective disorders can be complicated by two main factors in Deaf children. First the signing competence of the clinician (see Hindley et al., 1993, earlier) but also the problem of determining the difference between grammatical and affective features of facial expression. McIntire and Snitzer Reilly's (1988) study of the emergence of these features in Deaf infants developing ASL makes it clear that affective expression emerges first at approximately 1 year, with ASL grammatical features at approximately 2 years as two sign utterances emerge. Grammatical facial expressions are characterised by their clear and specific onset and offset pattern and their coordination with hand patterns. In contrast, affective displays are described as inconsistent and inconstant in their onset–offset patterns and in their shape.

Two studies have estimated the prevalence of affective disorders specifically in deaf children and adolescents. Abelftoutu and Telmesani (1993) used the Arabic version of the Children Depression Inventory to detect depression in 108 male students attending an institute for the Deaf in Saudi Arabia. Their mean ages were 13.04 years but the authors do not give the age range. The inventory was presented by a signing social worker. No indication is given as to any assessment of the accuracy of this translation. The prevalence of depression, using a conventional cut-off score of 19, was 6.5%; this compares with estimates of 2–8% prevalence for hearing adolescents and 0.5–2.5% for preadolescents (Harrington, 1994). Clearly, without knowing the age range of the students it is difficult to know how to interpret this study’s findings. Interestingly, almost 80% of the deaf students identified their father as the person they would turn to if they had a problem.
Leigh, Robins and Welkowitz (1990) used a linguistically simplified version of the Beck Depression Inventory (Beck, 1967) to estimate the rate of depression in 102 deaf undergraduates with limited contact with sign language. The age of the students is not given but they were all under 25 and had no additional impairments. All the students were severely to profoundly deaf, with age of onset of deafness at 2 years or less. Using cut-off scores of 10–18 for mild depression, 19–25 for moderate and 26 or over for severe depression, 43% of students scored in the mild range, 8% in the moderate range and none in the severe. The authors then looked at mode of communication and perceived communication of the students with their mothers, how much their mothers communicated with them and how much the student and their mother communicated orally with their mothers as communicating more with them. In turn, good perceived communication was negatively correlated with scores on the Depression Inventory (r = —.41). The authors investigated the relationship between mode of communication and inventory scores. Students using oral communication had the lowest scores whereas students using sign language had the highest; the difference between the oral and signing groups was significant (t = 2.38, p = .05).

These findings are somewhat different from those in Hindley's (1993) study of deaf and hard-of-hearing children and adolescents, in which there was a preponderance of psychiatric disorder in the hard-of-hearing group, with high rates of anxiety disorders, particularly social phobias. However, differences in design and ages of subjects are most likely to account for the different findings.

Fears, as elicited by a standardised questionnaire, do not seem to be significantly more common amongst deaf children than children with other disabilities or children without disabilities. In a study of deaf children attending regular and special primary and secondary schools in Australia (King, Josephs, Gullone, Madden & Ollendick, 1994), the Fear Survey Schedule for Children—Revised (Ollendick, 1983) was administered to 218 deaf children by their teachers. Although the fear scores of the deaf children were higher than those of the visually impaired and nondisabled children, there was no significant difference in their intense fears scores. No description is given of the deaf children's language use nor of any need to translate the questionnaires into Auslan. However, internal consistency of the different factors of the scale, as measured by Cronbach's Alpha, was good (.60-.94).

**Autism and Deafness**

Hearing impairment appears to occur more frequently amongst children with autism than would be expected (Gillberg et al. 1990; Steffenburg, 1991). The types and aetiology of deafness in these two groups is unclear. Gillberg et al. (1990, p. 588) describe 6/20 children with autistic disorders as having "moderate to severe conductive hearing deficit" on the basis of audiological, otological and acoustic brainstem response examinations. However, the exact audiological findings were not included in the study. Steffenburg (1991) describes 6/38 children with autism, audiologically assessed at 10 years, as having "neurogenic hearing deficits". One child is described as totally deaf, one has a hearing impairment of greater than 50 dB, one greater than 40 dB and four have hearing impairments of 25–40 dB. Gordon (1993) points out that the hearing impairment of only one of these children had been detected when the child had been studied 5 years earlier. This finding is consistent with the most comprehensive study of deaf autistic children (Juré, Rapin & Tuchman, 1991). The authors reviewed findings from a total of 1150 children seen by Rapin in a variety of clinical settings (School for the Deaf, children referred for private neurological consultation and children referred to an Auditory Evoked Response Laboratory). Of these children, 46/1150 (4%) met DSM—III–R criteria for autism. Only one child had a mild hearing impairment; the majority (37 or 80.4%) had severe to profound deafness. Gillberg and Steffenburg (1993) point out that it is likely that the apparently higher than expected prevalence of autism is accounted for by the clinically derived sample on which the estimate is based.

Juré et al. found that the median age of diagnosis of autism was 49 months, for hearing loss 24 months and for both hearing loss and autism 24 months. These findings suggest that autism and deafness both confound each others' diagnosis. At its most extreme, the hearing impairments of 7 children with autism were not confirmed until they were 5 years or older and they also found 16 deaf children whose autism was not confirmed until 5 years or older. Juré et al. found that 32.6% of the children had aetologies of deafness resulting from congenital or neonatal infection, neonatal problems or congenital hemiparesis. Causes of deafness for the other children included multiple congenital anomalies (17.4%), genetic hearing loss (13%) and unknown cause (37%). Six children had family histories of hearing impairment but not of autism and one had a family history of autism. Eight of the 46 children had epilepsy.

The authors used clinical ratings of the severity of autism and suggested that 27 lay in a mild to moderate group and the other 18 in a severe group. Performance IQs were available for 11 of the children and the authors made estimates of the other children's intellectual potential. Eight out of the 45 children were thought to be of normal intelligence and 9 were severely mentally retarded. Juré et al. were less certain about the remaining 28 children, assessing 13 children as mildly to moderately intellectually impaired and 15 as severely impaired. The clinical rating of severity of autism was not related to severity of deafness but was related to severity of intellectual impairment. Five children, all with mild to moderate hearing impairment, were able to speak. Of the other 41 children, 27 had received some sign language training, of whom 21 had some expressive sign. The authors found it difficult to assess receptive skills but judged them as adequate in 7 children; none of these children was either severely autistic or severely mentally retarded. Sign echolalia was reported in 5 of the 21 signing children.

Many of the children in this study had histories of highly disrupted or inappropriate schooling but Juré et al. suggest that some of the children benefited when they
moved into signing schools for deaf children with programmes for children with additional impairments. Juré et al. conclude that, although hearing impairment is unlikely to be an aetiological factor in autism, if the two conditions are coincident, hearing impairment can confound the diagnosis of autism and vice versa, and can in turn lead to late diagnosis and inappropriate medical and educational management. They suggest that the most appropriate educational placement for these children are special classes, within schools for deaf children, that can provide education in sign language and skilled behaviour management.

**Psychotic Disorders**

There is no recent literature about the presentation, prevalence or management of psychotic disorders in deaf children and adolescents. Kitson and Fry (1990) point out that grammatical differences between BSL and English may lead inexperienced clinicians to come to false conclusions about the written English of deaf adults, misdiagnosing written BSL as thought-disordered English. Thacker (1994) has shown that it is possible for a Deaf researcher systematically to classify thought-disordered BSL, as produced by Deaf adults with schizophrenia or manic depressive disorder, using the PSE (Wing, 1983). Jenkins and Chess (1991) caution clinicians about the difficulty that deaf children may have in communicating their experience of anticholinergic side-effects.

**Intervention and Management**

**Intervention**

The number of published, research-based interventions described for deaf children in the last 10 years is small. There are a number of early intervention programmes, one study of psychotherapy for children who have been sexually abused, one study and replication of a social skills training with oral deaf children and one of pharmacological treatment of self-injury in a multiply handicapped deaf girl. Although they are not research-based, there are a number of papers concerning family therapy with Deaf people. Meadow-Orlans (1987) provides a comprehensive analysis of the various different types of early educational interventions offered to deaf children and their families. She points out that the wide range of different variables that affect the development of deaf children (severity and type of hearing loss, time of diagnosis, presence of additional impairments, family environment, availability of education, etc.) make it difficult to design research-approach models. With this proviso, Meadow-Orlans reviews 13 differing programmes, of which 2 included measures of mother–child interaction or social and emotional adjustment as well as language and academic achievement. She concludes that the studies show that early intervention does have a positive impact on children’s language development and academic achievement. One study of an intensive early oral intervention showed significant improvements in mother–child interaction (Levitt, McGarr & Geffner, 1986) and another showed improvements in the child’s social and emotional adjustment following a home-based intervention using either total communication or oral interventions (Watkins, 1984).

Meadow-Orlans also reviews four studies that compared different educational interventions. Two studies (Greenberg et al., 1984; Musselman, Lindsay & Wilson, 1985) showed significant differences in social development, mother–child interaction and communication skills for children taking part in total communication programmes compared with children in oral programmes. In addition, Greenberg et al. found lower levels of stress amongst the total communication group, although it should be noted that their intervention group received intensive parent counselling whereas their control group did not.

Greenberg and Kusché have gone on to develop a specific programme to promote social and emotional development in deaf children: Promoting Alternative Thinking Strategies (PATHS) (Greenberg & Kusché, 1993). Their intervention is based on the ABCD (Affective–Behavioural–Cognitive–Dynamic) model of social and emotional development (Greenberg & Kusché, 1993) and aims to promote the children’s interpersonal problem-solving skills by teaching a self-control method, emotional recognition and problem-solving skills. They hypothesised that changes in the children’s affective–cognitive domains would lead to changes in behaviour.

The study used a waiting list design. Deaf children who were being educated in special classes using the total communication method, attached to mainstream schools, were randomly assigned to intervention and waiting list groups by classroom. The children were in years 1–3 and the mean ages of the children in the two groups were not significantly different. All the children had hearing losses of > 60 dB, had performance IQs of 75 or more and had no significant additional impairments. There were 28 children in the intervention group and 25 in the control group. There were no significant differences between the groups on a range of educational, audiological and sociodemographic factors, apart from the fact that, on average, the intervention group had been introduced to sign language one year before the control group (33.8 months vs. 45.2 months, \( p = .05 \)) and had more mainstream experience during the week (5.5 hours vs. 3.5 hours, \( p = .01 \)).

All the children were assessed pre- and post-intervention and at 1 and 2 years using a variety of child, teacher and parent measures. These measures covered five domains: cognitive-academic measures; interpersonal problem solving and impulsivity; emotional understanding; teachers’ ratings of behavioural and emotional functioning; and parents’ ratings of behavioural functioning. The latter two used the Meadow Kendall Social-Emotional Inventory (SEAI) (Meadow, 1983), the Health Resources Inventory (Gesten, 1976) and the Walker Behaviour Problem Identification Checklist (Walker, 1976) for teachers and the Child Behaviour Checklist—Parent Form (CBCL) (Achenbach & Edelbrock, 1983) and the Eyberg Child Behaviour Inventory (Robinson, Eyberg & Ross, 1980).

There were significant improvements in a variety of domains post-intervention in the intervention group: social skills (turn taking, generating prosocial solutions);
emotional recognition; frustration tolerance; and impulsivity. The reading levels of the intervention group were also significantly higher than those of the control group. There was a significant main effect on the Emotional Adjustment subscale of the SEAI \((p < .05)\) and amongst younger children on the Self-Image subscale \((p < .05)\). Significant group differences were found using the CBCL Social Competence subscale but not on the Externalising scales of the CBCL and the Eyberg nor on the Internalising subscale of the CBCL. Greenberg and Kusché computed change scores for children in both groups. Some of the children had not shown affective-cognitive deficits at pre-test and they were excluded from this subsample. Measures of social problem solving, emotional understanding and teacher and parent ratings of behaviour pre- and post-test were transformed to \(z\) scores and correlations were then computed. Their findings offer partial support for their model.

The only research-evaluated intervention for children with clinical problems studied the effects of psychotherapy on the behaviour problems of deaf children who had been sexually abused (Sullivan, Scanlan, Brookhouser, Schulte & Knutson, 1992). The 72 children involved (51 boys and 21 girls) were aged 12–16 years and were all at a residential school for deaf children. They had all been sexually abused either by residential care staff or by older students. The authors were able to use an intervention vs. control group because just over half of the parents declined the offer of therapy for their children. As such the two groups may not be strictly comparable and it is likely that the control group had higher levels of family pathology. For this reason, and to avoid rater bias, Sullivan et al. employed a random assessment assignment model for both treatment and control groups and houseparents were not informed of which children were receiving therapy.

When Sullivan et al. compared the severity of abuse experienced by the children in the two groups, they found that the boys in the treatment group had experienced more severe abuse (severe abuse = anal/vaginal penetration) than those in the control group, whereas the reverse was true for girls in the treatment group. Sullivan et al. used the CBCL (Achenbach & Edelbrock, 1983), completed by houseparents before and after the psychotherapy had been completed. The psychotherapy consisted of 36 two-hour weekly sessions conducted by therapists with Masters mental health qualifications who were also fluent in sign language and “training and expertise in the psychology of deafness” \((p. 300)\). The aims of the psychotherapy are described in more detail elsewhere (Sullivan & Scanlan, 1990) but were both educational and psychotherapeutic, and intended to treat the consequences of abuse and prevent re-victimisation.

Sullivan et al. found that, pre-treatment, the boys in the treatment group had higher CBCL ratings than those in the control group but that there were no significant differences for the girls. Using a two-factor analysis of variance (ANOVA) with the total and subscales scores on the CBCL post-treatment, they found that boys in the treatment group had significantly lower total CBCL scores and subscale scores, except on the Schizoid and Obsessive subscales. Girls in the treatment group had significantly lower total and Externalising scores and on the Depressed, Aggressive and Cruel subscales. The authors speculate that internalising symptoms may need longer therapy in girls.

Rasing and Duker (1992) and Rasing (1993) present findings from a study, replicated in the second paper, using social skills training with a group of deaf children with “severe language disabilities”; unfortunately the nature of these disabilities are not described. Using a package of instruction, role-playing, modelling and problem-solving instruction, Rasing and Duker found that the package had a significant impact on target social skills and problem behaviour.

Lang and Remington (1994) describe the treatment of severe self-injurious behaviour in a deaf-blind girl of 14 with severe to profound mental retardation. Using 10-minute sampling, 3 times a day they recorded an average rate of self-injury of 165 episodes in 10 minutes. Over 9 months her propranolol, in combination with thyro- 


dazine, was progressively increased to 100 mg 3 times/ 
day and her self-injury fell to 26 episodes per 10-minute 
sample. Over the same period the girl’s social interaction 
and demeanour improved. The rate of self-injury rose 
when her thioridazine was discontinued but returned 
to the lower rate when it was reintroduced.

Family therapists working with deaf families have 
readily adopted the cultural model of deafness, using it to 
explore the meaning of communication difficulties in 
families with hearing parents and deaf children and deaf 
parents and hearing children (Harvey, 1982; Sloman 
& Springer, 1987). They have also acknowledged that grief-like responses to the birth of a deaf child to hearing 
parents, and failure to resolve these feelings, can play a 
significant part in whether or not such families develop 
problems (Sloman, Springer & Vachon, 1993). In the 
main these authors have worked with sign language 
interpreters, even when they had signing skills themselves 
(Harvey, 1982). Sloman and Springer (1987) saw circular 
questioning, positive connotation and prescription of 
routines as the three most useful interventions when 
working with deaf families.

**Management**

Schools for deaf children offer an opportunity to 
develop both preventative mental health strategies (see 
Greenberg & Kusché, 1993, earlier) and direct inter-

vention. Recognition of the importance of language use 
with respect to self-esteem has come with the growth in 
awareness of sign language and Deaf communities. 
Sorensen (1992) describes a preventative mental strategy 
that uses ASL and Deaf culture as central components in 
supporting deaf school children in developing a Deaf 
cultural identity. In a different vein, Sarti (1993) describes 
a modified therapeutic community approach, embedded 
in a school for deaf children, enhanced by the use of role 
play, “rap”—literally rapping as a means of emotional 
catharsis—and video feedback.
There are accounts of three different approaches to managing deaf children as inpatients. McCune (1988) offers a thoughtful account of the implications to staff and children when deaf adolescents are admitted to hearing inpatient units. These include additional resourcing for communication training for staff and children and the need to second staff experienced in working with deaf children to minimise the effects of limited communication on the therapeutic process. He highlights how easily a deaf child in this situation can become scapegoated and how, in contrast, staff's expectations of the possibility of change can often exceed reality.

The accounts of inpatient units for deaf children share a belief in the need for a highly structured environment (Burnes, Seebolt & Vreeland, 1992; Hoetink, van Olst, van Duyn & Hilberink, 1994). They differ in other important respects. Burnes et al. describe a unit in which sign language and Deaf cultural identity are central and highly esteemed and in which 50% of the staff are Deaf. Their therapeutic programme is primarily behavioural, with a large educational component concentrating on reading and ASL. In addition they describe active involvement with the families. Hoetink et al. are all hearing, and describe the children in their unit as having considerable communication difficulties, particularly in the recognition and naming of feelings. They place great emphasis on containment, both physical and psychological, and make use of visual means of enhancing this, such as colouring all the different areas of the unit to help the children identify where they are.

Mental Health Aspects of Cochlear Implants

Cochlear implants are electronic assistive hearing devices that process sound and deliver an electronically amplified signal directly to the acoustic nerve, unlike acoustic hearing aids, which amplify sound to the ear. They have been demonstrated to be effective in helping postlingually deafened adults and children to hear speech, but their effectiveness in prelingually deaf and perilingually deafened children and adults is unclear. Their use with deaf children is particularly controversial and has provoked fierce criticism from Deaf communities across the world (e.g., Anon., 1990). Mental health professionals have been involved in cochlear implant programmes in three ways: in highlighting the ethical dilemmas that surround their use (Power & Hyde, 1992; Vernon & Alles, 1994), in helping to identify the psychological characteristics of children and their families and the processes that help to identify those children most likely to gain from a cochlear implant (Quittner, Thompson Steck & Rouiller, 1991; Kampfe et al., 1993), and in identifying the psychosocial consequences for the child’s family but not, to date, for the child (Downs, Campos, Firemark, Martin & Myres, 1986; Quittner et al., 1991).

The ethical dilemmas are, first, that cochlear implants are of doubtful or unproven benefit in prelingually and perilingually deaf children, that encouraging parents to seek cochlear implantation serves to delay acceptance of deafness and the learning of sign language, that national organisations of deaf people have not been involved in decisions about the licensing of cochlear implants and that it is unethical to submit children to irreversible, potentially life-threatening surgery when its benefits are unproven (Anon., 1990). In contrast, advocates of cochlear programmes argue that any improvement in deaf children’s ability to perceive sound and so speak are of benefit to them (Moog & Geers, 1991). In turn, critics point out that studies of the audiological, linguistic and psychosocial effects of cochlear implants are almost exclusively carried out by members of cochlear implant teams (Vernon & Alles, 1994). Those that are conducted by independent investigators suggest that the benefits offered by implants over conventional hearing aids are at best slight (Allen, Rawlings & Remington, 1993). Finally they argue that the large amounts of money invested in implant programmes might be better spent on ensuring that appropriate conventional support—sign language tuition for families, acoustic or vibrotactile hearing aids, etc.—is offered to all children and families (Power & Hyde, 1992; Vernon & Alles, 1994).

As with the initial confirmation of deafness, assessment for implantation stirs up powerful feelings. Persistent difficulty in accepting a child’s deafness may lead to inappropriate expectations about the benefits of a cochlear implant (Kampfe et al., 1993) and in turn intensify parental distress post-implantation (Quittner et al., 1991). Checklists of parental expectations may help professionals to identify parents with unrealistically high expectations and the provision of education and guidance about the effects of an implant and counselling for parents can help to ensure that the parents of children entering an implant programme have the clearest expectations possible (Kampfe et al., 1993).

Educational and audiological support post-implantation are vital but taxing for both child and family; commitment and motivation of the child and family are also vital. It remains unclear whether or not the benefits seen with cochlear implants are primarily as a result of this level of commitment or the implants themselves (Vernon & Alles, 1994). It does appear that family stress (as measured by three instruments: the Time Demands Scale of the Questionnaire on Resources and Stress; the Communication and Stress Subscales of the Impact of Childhood Hearing Loss and the Family Stress Scale) and parental distress (using the Center for Epidemiological Studies—Depression Scale and the Symptom Checklist—90—Revised) is no less for parents of children with implants than for families with deaf children generally (Quittner et al., 1991). However, it should be noted that the number of children in this study was small (N = 29) and that Quittner and her colleagues do not specify their control population and appear to have used normative data from an unrelated study for at least one of their measures (the Impact of Childhood Hearing Loss). Quittner et al. point out that, to date, no study has been conducted to examine the stress experienced by the children themselves or their psychosocial adjustment.

Conclusions

In the 20 years since Roger Freeman wrote his annotation there has been a quantum leap in our understanding of the psychological and social development of deaf children. In particular, the move away from deviance models of deafness to cultural models has
opened a new world of possibilities both for researchers and clinicians. The effectiveness of early intervention studies providing early sign language in conjunction with parent counselling (e.g. Greenberg et al., 1984) and later interventions promoting social and emotional development, such as PATHS (Greenberg & Kusché, 1993) show us that interventions firmly rooted in this understanding can have a considerable impact on deaf children’s mental health. Quittner et al.'s (1990) findings in relation to early parent coping suggest that the direct teaching of parenting skills to hearing parents of deaf children, informed by the knowledge and skills of Deaf parents, could be of equal importance. These studies underline the importance of close cooperation between audiological, educational and social scientists and mental health workers. Collaborative research amongst these groups could lead to studies investigating the behavioural effects of surgical intervention in OME or the psychosocial effects of cochlear implantation, amongst many other studies.

At the same time this new awareness underscores how little we understand about psychiatric disorders in deaf children. We are more aware of the effects of linguistic difference on assessing deaf children’s psychiatric states and yet that knowledge has still to be translated into an epidemiological study. Such a study could also help to clarify the influence of different school settings on the mental health of deaf and hard-of-hearing children and young people. In addition it could be the beginning of a process of looking more carefully at the presentation of psychiatric disorders in deaf children. Do modes of communication and their effects on facial expression affect the presentation of affective disorders? What are the features of language disorder in deaf children with autism? Are there similar interactions between deafness and autism as those seen in blind children?

For these studies to occur we clearly need to bring a variety of instruments developed with hearing children and families into the arena: for instance, how disordered communication in families with hearing parents and deaf children influence mental health. Is it an absence of communication or a distortion of communication that is most powerful? Studies using measures such as expressed emotion might help to clarify this.

Finally, apart from Sullivan et al. (1992) and Greenberg and Kusché (1993) we have no research-based evidence as to the effectiveness of interventions with deaf children. We know that we must adapt our interventions, but at what cost? As Deaf professionals play an ever-important part in the delivery of mental health services to deaf children, our knowledge of how to deliver these interventions will grow, as will our knowledge of their effectiveness but, in the era of evidence-based medicine, one of the most striking features of this review is the paucity of research-based studies of the effectiveness of mental health interventions with deaf and hard-of-hearing children. Surely this must become the next area of growth in the field in the next 20 years?

References


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