

August 2005 • [Volume 99](#) • [Number 8](#)

Emotional Status and Development in Children Who Are Visually Impaired

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Abstract: This study examined the developmental attainments of children with visual impairments, aged 6–59 months, with and without emotional deficits, behavioral deficits, or both. It found that an emotional or behavioral deficit was significantly related to gross motor and visual motor integration, expressive and receptive language, and social or personal development, and that there was an interaction between the effect of the mother's education and the child's age on the child's perception of language.

The authors are indebted to the children and families who participated in the study and to Rivka Abiry for her help in preparing this manuscript.

To date, studies on the development of children who are visually impaired (that is, those who are blind or have low vision) have focused mainly on the relationship among the children's levels of vision, comorbidities and gestational age, and developmental attainments (Hatton, Bailey, Burchinal, & Ferrell, 1997; Tröster & Brambring, 1992). The possible effect of visual impairment on attachment and socialization has also been suggested (Fraiberg, 1977; Preisler, 1991), and the increased prevalence of specific emotional and behavioral problems, as well as developmental delays, among visually impaired children has been established

(Rudd, 1982; Tirosh, Schnitzer, Davidovitch, & Cohen, 1998).

Therefore, the mutual effect of emotional problems on the development of visually impaired children, and vice versa, is of great importance. Such an understanding may influence treatment strategies that are related to development at different ages, particularly among infants and young children. Yet the research methodology that is needed to assess the mutual relationship between developmental attainments and emotional status is extremely complicated.

It has been proposed that different emotional and behavioral deficits are specifically related to visual impairment in early childhood (Jan, Freeman, & Scott, 1977; Tirosh et al., 1998). The effects of mothers' behavioral characteristics and emotional status and children's development and visual impairment on the development of children who are visually impaired have been reported (Hughes, Dote-Kwan, & Dolendo, 1999). However, to our knowledge, only one study analyzed the relationship between children's emotional or behavioral status and development (Tröster & Brambring, 1992). This study included infants aged 9 months and 12 months who were compared to age-matched full-term sighted infants. The authors found a significant correlation between motor development and social and emotional development but did not examine the relationship between developmental attainments and emotional and behavioral status.

As Tröster and Brambring (1992) acknowledged, a comparison of both the developmental attainments and social and emotional status of children who are sighted and blind, using the same scales, is difficult, as is the assessment of the additional risks of prematurity for both the emotional status and the development of children who are blind. It has been suggested that the comparison of a group of children who are blind to their sighted peers may result in false labeling of problem areas that are specific to the

sensory impairment (Groenveld, 1998). Thus, it appears that investigating a within-group difference in children who are visually impaired who have no other developmental risk could be a methodologically acceptable approach to identifying the relationship between development and emotional status. The purpose of the present study was to identify a group of children with visual impairments and emotional or behavioral deficits and to compare their development with that of visually impaired children with no emotional or behavioral deficit as related to age.

The hypothesis for this study was that there will be a significant delay in the social and language development and a less significant delay in the fine and gross motor functions of children who are visually impaired and have emotional or behavioral deficits. It has been shown that the emotional status of infants who are blind changes at least in early infancy (Tröster & Brambring, 1992). We therefore further hypothesized that such a relationship will increase with age.

Methods

Participants

Of the 210 children who were admitted to a unit that is specifically for children who are visually impaired (aged 0–5) in a large child development center in Israel between 1975 and 1993, 74 (35%) were identified as suffering from an "isolated" severe congenital visual deficit with no other handicap or disability. The criteria for inclusion were (1) a visual impairment, with a visual acuity equivalent to 6/60 or lower (or $\leq 20/200$ best corrected visual acuity in the better eye), categorized as legally blind; (2) no other chronic illness; (3) living in a two-parent family home; and (4) attending the unit regularly for assessment and follow-up, as well as treatment.

Of the 74 children, 50% were Arabs and 50% were Jews; 45 (61%) were boys and 29 (39%) were girls, who ranged in age from 6 months to 59 months at the time of admission (with a mean age of 17.2 months). The mean birth order was 2.4. Albinism was the underlying etiology in 44.6% of the children, cataracts in 29.2%, Leber's amaurosis in 16.2%, and high myopia in 9.5%. Since maternal education has been proven to significantly affect infants' development in Israel (Ivanans, 1975), it has been included in our analysis.

Procedure

Development was assessed by a multidisciplinary team that included a developmental pediatrician who was particularly trained in visual disabilities, a speech therapist, a physiotherapist, an occupational therapist, a psychologist, a social worker, and a special education teacher. Some of the personnel had worked in the unit for 20 years or more, and most of the procedures they used, as well as standardized documentation, were maintained throughout the period covered by the study. New professionals who joined the team were trained at the unit and followed well-established, consistent clinical guidelines. Physical and neurological examinations were performed. The degree of visual function was evaluated by an ophthalmologist as well as by the developmental pediatrician, using the Diagnostic Assessment Procedure Kit by Barraga and Morris (1980). For the developmental assessment, a variety of tests were conducted (Gesell & Amatruda, 1954; Reynell & Zinkin 1975). The tests pertained to gross motor skills, perceptual fine motor skills (with subtests for fine motor, spatial orientation, and eye-hand coordination), daily living activities, social skills, and language. All scores were converted to developmental quotients. The children were enrolled in a developmental habilitative program that was tailored to their needs. They were followed up every six months.

The emotional and behavioral status of each child was assessed by the psychologist and social worker. For the children with an undefined emotional or behavioral status, video recordings of them in free play and with their parents were analyzed at a later stage. The children's emotional and behavioral status was defined as abnormal on the basis of clinical assessments and agreement by all the team members, combined with the parents' reports. For the purpose of this research, only children who were labeled as having an emotional or behavioral deficit in their charts and hence were enrolled in a systematic psychological intervention were assigned to the study group. The children were defined as having an emotional or behavioral deficit when the deficit lasted more than six months, despite treatment of at least six months.

In previous research (Tirosh et al., 1998), we found that almost 40% of the children who were diagnosed as having an emotional or behavioral problem could not be assigned a diagnosis using formal criteria, such as those found in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994). The lack of an instrument that is adequate for the emotional and behavioral assessment of such a large age range and our interest in the children's emotional and behavioral status, rather than in a restrictive concept of disorders, prompted us to use a multisource unstructured procedure for classification purposes. The children with emotional or behavioral deficits were classified as manifesting a single deficit or a combination of deficits. The criteria were based on the *Diagnostic and Statistical Manual for Primary Care* (American Academy of Pediatrics, 1996) and included the following problem areas: insecurity or withdrawal, attachment problem, inattentiveness, impulsive or hyperactive oppositional-defiant behavior, temper tantrums, and bedding and toileting problems. A second group without these manifestations served as a comparison group.

Children with the typical behaviors that are often associated with visual impairment and are sometimes mistakenly perceived as pathological—such as eye poking or pressing or stereotyped hand movements without other signs of emotional or behavioral deficit (such as an autism spectrum disorder or an anxiety disorder)—were not included. Similarly, children with a restricted body-movement repertoire and a stooped position mimicking depression, as well as those with sleep problems, were not classified as having an emotional or behavioral deficit. Maternal education was classified in two categories: high level of education (graduation from high school, college, or university) and low level of education (up to the eighth grade).

Statistical analysis

The SAS program was used to analyze the data. Analysis of variance and mixed-model analysis were used to account for repeated measures. Mother's education and child's emotional status were considered the main explanatory variables, and developmental achievements were considered the outcome variables. In addition, the effects of socioeconomic status (Office of Population Census and Surveys, 1971), ethnic affiliation, birth order, and age of assessment were compared between the children who had and did not have emotional or behavioral deficits. Age groups were defined as follows: 6–9, 10–14, 15–21, 22–26, 27–31, 32–38, 39–47, and 48–59 months. The number of children who were assessed in each age interval ranged from 10 to 25, with a mean of 16.7 children per interval.

Results

Of the 74 children, 16 (21%) were diagnosed as having a significant emotional or behavioral deficit. The effects of the children's emotional and behavioral status, as well as of maternal

education, on the children's development are depicted in [Table 1](#).

Gross motor achievement was significantly related to emotional and behavioral status ($F = 17.0, p = .001$), as well as maternal education ($F = 5.9, p = .01$). No significant interactive effect was found between emotional and behavioral status and maternal education or child's age on gross motor performance. Although a significant difference in visual-motor integration between children with and without an emotional or behavioral deficit was evident ($F = 7.2, p = .02$), no relationship between other fine motor attainments and spatial orientation and emotional or behavioral status was found. Older age was significantly associated with a decrease in fine motor performance ($F = -4.1, p = .004$). Expressive language attainments were associated with emotional and behavioral status ($F = 11.2, p = .001$), with no significant effect of maternal education.

Emotional and behavioral status also had a significant effect on a child's perception of language ($F = 6.35, p = .01$). However, an interaction was noted between the effect of age and mother's education on the child's perception of language ($F = 4.2, p = .04$). The older the child and the less educated the mother, the more compromised the child's perception of language. Achievements in the personal social area were significantly related to emotional and behavioral status ($F = 8.6, p = .005$), with no effect of maternal education. No relationship between developmental attainments and socioeconomic status or ethnic group was evident.

Discussion

A 20% prevalence of emotional or behavioral deficits among the children with "isolated" visual impairments in the present cohort is low. Previous investigations revealed a higher prevalence (Rudd, 1982; Tirosh et al., 1998). It is possible that this selected group of visually impaired children with no other disability and a

well-established supportive service contributed to the prevention of emotional impairment. Furthermore, since the upper age limit of the children was 5 years, it probably excluded a proportion of children who develop emotional problems in later childhood.

The results of this study indicate that there is a strong association between development and emotional and behavioral deficits in children who are visually impaired. This association has been suggested by other researchers (see Fraiberg, 1977; Sonksen, Levitt, & Hitsinger, 1984). However, the majority of previous observations were generated from a heterogeneous group of children with visual impairments who had a variety of neurological disorders and severe social disadvantages. The present study excluded children with such risk factors.

It should also be noted that the literature has mainly compared children with different degrees of visual impairments with sighted children. In contrast, this study focused only on children who were all diagnosed as legally blind, and thus the degree of visual function was partialled out. The main limitations of this study were the small sample and the consequent lack of a distinctive diagnostic classification of emotional and behavioral deficits.

In her study of neurologically intact children who were blind, Fraiberg (1977) observed a delay in the constitution of self and of an object world. Such a delay may conceivably be associated with a delay in both motor and cognitive attainments. The dependence, passivity, and lack of initiative that have been reported to be common among visually impaired children (Jan et al., 1977) could also result in a general developmental delay. Although Hatton et al. (1997) documented the age-related developmental delay of children who were visually impaired, they did not assess the children's emotional or behavioral status.

It should be noted that the pattern of association between

emotional and behavioral deficits and children's developmental attainments other than gross motor and language perception was independent of age, as well as of other risk factors, such as mother's education. We cannot account for this specific relationship. However, we speculate that the effects of environmental enrichment on language (particularly among children with a sensory impairment) increases with age.

A finding that is of great interest and that contradicted our original hypothesis was that gross motor attainment was also significantly delayed in the children with emotional and behavioral deficits compared to those without emotional deficits. The different affective processes that contribute to motor delay among children who are visually impaired have been reviewed (Tröster, Hecker, & Brambring, 1994).

The less-expected association between gross motor function and emotional and behavioral status compared to the lack of association between fine motor function (other than visual-motor integration) and emotional status is also interesting. Gross motor performance is probably more dependent on children's level of security and the desire for social interaction, on the one hand, and exploration, on the other hand. Therefore, children with a less-optimal emotional status will be more delayed, whereas their fine motor function (other than visual-motor integration), which does not require the same degree of security, will be less affected.

The possible reverse relationship between development and emotional and behavioral status can be argued. It is possible that a more vulnerable subgroup of children who are visually impaired is prone to develop more severe emotional and behavioral and developmental problems. At this stage, we cannot establish the possible effect of delayed development on the emotional status of these children. We also cannot identify physiological or environmental risk factors that may underlie a primary

developmental deficit in these children versus children without emotional difficulties. Therefore, it appears that the children's compromised developmental attainments may be the result of the emotional difficulties.

Tröster and Brambring's (1992) study on premature infants who were visually impaired found a significant relationship between social and emotional development, gross motor development, and fine motor development. These researchers suggested that the emotional scale that was used in their study did not require motor involvement, whereas social interaction, impulse control, and social emotional development require more-developed motor skills. It is not inconceivable that the findings of our study represent a simple, not casually related, link between different developmental functions and emotional status. It should be noted that we studied only visually impaired children with no neuromotor deficit and that the social and language development of some of these children were also impaired. It has been suggested that some emotional or behavioral patterns that are considered deviant in sighted children (Freeman & Groenveld, 2000) are typical of children with visual impairments and should not be interpreted as pathological (Groenveld, 1993). This study controlled for such bias. Therefore, we caution against a possible underdiagnosis of such children that may affect their developmental progress. The results of this study underscore the importance of the early identification of children with emotional deficits. Prompt intervention at a young age may facilitate more-optimal emotional development and consequently enhance children's developmental attainments.

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