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AUTHOR Pirila, Silja; And Others
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ABSTRACT

Play is a central facilitating element of early development. As a child plays, he or she practices spontaneously cognitive, emotional, and motor abilities. This research project, part of a larger project on early intervention with young disabled children, investigated the play of children with a motor handicap. The sample consisted of 61 disabled children age 0 to 7 years who regularly visit the department of Paediatric Neurology at Tampere University Hospital in Finland. Cognitive development and motor functioning were assessed with formalized tests, and play activities (both structured and unstructured) were videotaped, and the level of play and motor functioning were assessed. Preliminary results, presented in three examples of individual children, revealed extensive variation among children. Although most made progress in play activities and in mental and motor functioning, several did not (they had severe mental and motor disabilities). The capacity of the child's gross motor functioning affected play development: the better the gross motor functioning, the higher the level of play. Results also suggested that disabled children exhibit pattern of developmental play sequence similar to that of nondisabled children. (Contains 38 references.) (EV)

THE PLAY OF DISABLED CHILDREN IN EARLY DEVELOPMENT

Silja Pirilä
Tampere University Hospital
Tampere, Finland

Pirkko Nieminen
Tampere University Hospital
Tampere, Finland

Ritva-Liisa Seppänen
Tampere University Hospital
Tampere, Finland

Raija Korpela
Tampere University Hospital
Tampere, Finland

This article deals with one of the key aspects of early development: play. Studies concerning the development of play have been inspired by the work of Jean Piaget (1962). Piaget viewed the onset of symbolic play, together with language and deferred imitation, as simultaneous manifestations of underlying semiotic function. From this cognitive viewpoint, the ability to pretend expresses the emerging representative ability. Pretense has been examined also from the social, contextual standpoint (Bretherton et al., 1984). In this article play is examined in the cognitive framework.

Play has been used as a developmental indicator of the growing cognitive maturation of children. (Piaget, 1962; Lyytinen, 1989, 1990, 1991; Nieminen, 1991.) It has also been used as a therapeutic method for emotionally disturbed (Nader & Pynoos, 1991; Kajamaa, 1988; Koski, 1974), physically or mentally disabled children (Missiuna & Pollock, 1991; Thomasson, 1974; Wolfberg & Schuler, 1993; Brunberg, 1974).

This article deals with the play of children with motor handicap. The target group consists of children aged 0 to 3 years who regularly visit the department of Pediatric Neurology for assessment and rehabilitation. The children have been diagnosed as having brain damage due to prenatal difficulties and various complications in pregnancy or delivery, which have caused motor handicap and possibly some other disabilities. Preliminary results are presented concerning the mental status, recovery of motor function and level of symbolic play of some disabled children.

The role of play in early development

Play is a central facilitating element of early development. As the child plays, he practises spontaneously cognitive, emotional and motor abilities. Developmental trends of play activity have been actively explored. (Piaget, 1962; Nieminen, 1991; Lyytinen, 1990, 1991; McCune-Nicolich & Fenson, 1984).

It has been shown that qualitative changes occur in the development of symbolization during the first three years of life. Sensorimotor undifferentiated exploration develops through appropriate toy play and presymbolic imitative actions towards the symbolic use of objects. (Rosenblatt, 1977; Piaget, 1962; Belsky & Most, 1981; Vondra & Belsky, 1991; Lyytinen, 1990, 1991; Nieminen, 1991.) The appropriate use of objects is based on the visuomotor, and, also, conceptual integration. In symbolic toy play, behavior is not only guided by immediate situational and perceptual constraints but also by meanings given to objects and to the situation. (Vygotsky, 1978.)

Normally developing children transfer from presymbolic to symbolic activity fluently and quickly. Profoundly mentally disabled children never enter the symbolic stage (Brunberg, 1974). The same is true of severely autistic children if no specific habilitative support is available (Wolfberg & Schuler, 1993). Other handicapped children often stay at the presymbolic levels for a longer time - months, even years - than nondisabled peers, before developing any symbolic abilities. (Westby, 1991.)

In various studies, the growing capacity of pretend actions have been characterized by three trends: decentration, decontextualization, and integration (Piaget, 1962; Fenson, 1984; Lyytinen, 1990, 1991; Bretherton et al., 1984; Belsky & Most, 1981). Decentration refers to the child's increasing ability to incorporate players other than himself into the activity. It implies the understanding that objects and agents around him are independent of the self. Decontextualization, in turn, signals the first steps of the child towards acquiries arbitrary symbol systems. It is reflected by object substitution and the invention of imaginary objects. Integration exemplifies the child's increasing ability to combine separate actions into coordinated action sequences.

These concepts especially describe pretend actions (Fenson, 1984). Fenson (1984) and Lyytinen (1991) have adapted the action-based pretence concepts to deal with linguistic expressions. Action and language categories co-vary (Lyytinen, 1991). Both modes are age-dependent and serve complementary roles in children from age 20 to 31 months (Fenson, 1984).

Symbolic play, based on images and object manipulation, generally evolves at the age of one to two and acquires its peak around the age of four. The transition to role games takes place at the age of two to three. (Helenius, 1993; Nieminen, 1991.) A Linearly increasing age trend is found in play behavior (Lyytinen, 1991). Individual variation in play actions is thus limited in normal development. However, for linguistic utterances no significant age trend could be shown in children from age 2 to 6 years (Lyytinen, 1991). Individual variation is, thus, bigger in pretend language than in pretend action.

Motor disability and play

The impact of disability on early development varies. Development is dependent on many factors, the most important of them being the type, location and degree of damage in the brain. Besides the direct effects, early lesions have secondary effects on subsequent development. These can be either compensatory or detrimental. (Korkman, 1988.) Infants with focal brain damage have a greater capacity for recovery of motor function than adults (Fujimoto et al., 1994). However, the plasticity of the developing brain is limited. The varied effects of motor handicap are related to individually developing mental, hearing, visual and social abilities. Inadequate physical, social, and functional environment can increase the severity of impairment (Tammela, 1994; Korpela, 1993; Carlson, 1986).

Motor impairment is often caused by cerebral palsy (Cp). Cerebral palsy is an umbrella term for a variety of congenital and early neurological disorders (Fujimoto et al., 1994; Tammela, 1994; Paloneva, 1994). The causes of Cp vary from prenatal infarction of periventricular white matter to hypoxia at birth, traumatic infections etc.. The impact of Cp can range from mild to severe in the degree to which the disability interferes with the child's ability to function independently. The types of Cp are diverse and classified according to clinical findings. (Iivanainen, 1994; Missiuna & Pollock, 1991; Paloneva, 1994; Tammela, 1994.) No direct relation can be found between mental capacity and degree of physical impairment in cerebral palsied children (Kirk & Gallagher, 1979).

Motor handicap is often accompanied by additional disabilities like abnormal oral-motor patterns, speech or visual disorders, hearing or sensory losses, mental retardation, or epilepsy. An average of 80 % of children with cerebral palsy have one or more additional handicap, most generally speech

disorder. (Paloneva, 1994; Korpela, 1993; Tammela, 1994.) In this sense, motor handicap is also often a multimodal disability. (Cp-opas, 1983; Palsio, 1994; Pääkkönen, 1990; Simeonsson et al., 1982; Swanson et al., 1992.)

There has been little research work done concerning the play behavior of handicapped children. (Mindes, 1982; Westby, 1991; Missiuna & Pollock, 1991; Wolfberg & Schuler, 1993.) The results reveal similar findings. Handicapped children exhibit the same developmental play sequences as normal children, but development occurs more slowly and unevenly. There is greater variability in the skills present at any developmental level than normally. Skills that usually emerge together do so less frequently in handicapped children. (Westby, 1991.)

The level of play behavior does not always match the mental level in children with motor impairment. The amount of the discrepancy depends on the type and the severity of disability. A child with mild cerebral palsy may have poor hand function, limiting his or her ability to manipulate a toy as desired; a child with more severe impairment may be unable even to communicate his or her interest in a toy (Missiuna et al., 1991). These children tend to engage more frequently in isolated and toy-directed behaviors and less in social interactive and creative play. Increased dependence on others' guidance, a lack of assertiveness, and poorly developed social skills in unstructured situations are a few of the difficulties that may be experienced by disabled children. (Mindes, 1982; Bretherton, 1984; Paloneva, 1994; Missiuna & Pollock, 1991.)

Motor disability can slow down, or in severe cases prevent, favorable development of play behavior. Several secondary reasons, social and educational, may arise as a result of the primary handicap. Home-based rehabilitation and ADL-activities take time, and play activities might be replaced by them. In play activities parents and siblings, regardless of age, often arrange the frame and content of play for a disabled child. Play situations may become hierarchical and overprotective, as truly reciprocal interaction is missing. (Missiouri et al., 1991; Westby, 1991; Rosenblatt, 1977.)

Elicited play as a tool for promoting symbolization

The effects of modelling and guidance on the play of nondisabled children have been studied by several authors (Lyytinen, 1989; Nieminen, 1991; Bretherton et al., 1984; O'Connel et al., 1984; Fenson, 1984). Far less information is available concerning its effects on the play behavior of disabled children. However, elicited play is frequently used with severely disabled children, who have difficulties in participating actively in play, but who can see, hear and/or sense the play. The crucial issue is if the mere following of play activity positively affects the developing abilities of a disabled child, where overt manipulation of toys or imitation is missing?

Lyytinen (1989) studied the effects of modelling on the symbolic play in nondisabled 36-month-old children. She noticed that the effect of modelling was dependent on the base level of symbolic skills. After modelling the level of symbolic play was, on average, higher than before. The modeling activated both play activity and verbal utterances. Modelling was most beneficial for those children whose spontaneous play activity included very few symbolic elements.

O'Connell and Bretherton (1984) observed 20- and 28-month-olds in two play sessions with their mothers at home and in the laboratory. They found out that 20-month-olds demonstrated an increase in both exploratory and combinatorial play diversity when the mother was playing with the child, whereas 28-month-olds showed an increase only in their symbolic play repertoire when playing with their mothers. The mothers were active, but not very specific, teachers of their children, providing the child with wide-ranging guidance. Children selected and determined which of mother's suggestions were incorporated into the play activity and which were ignored. 20-month-olds used mostly the mothers' exploratory and combinatorial suggestions. 28-month-olds found the mothers' guidance in symbolic play most useful.

Nieminen (1991) had similar results in her two-year-long observation of 10 mother-child dyads. The transfer from mother-driven to child-driven play activity was evident at the age of 18 and 24 months and was accompanied by a change of dominance also in the linguistic domain.

Some interesting issues are, if the change from mother-driven to child-driven activity is necessary for the developing symbolic play skills of children? How does turn-taking happen between disabled children and their parents and therapists? Do hierarchical play situations, as experienced by disabled children, slow down or prevent this process, and if so, how detrimental are the consequences?

There is lack of adequate research concerning the effects of elicitation and promotion of play on motor handicapped children. Its effects have, however, been studied with another neurological dysfunction, autism. Wolfberg and Schuler (1993) demonstrated in their research concerning the play of three severely autistic children that it was possible to enhance the play activity to a symbolic level by means of an integrated play group method with periods of adult guidance.

Method

This study is a part of the larger research project "Early Intervention and Young Disabled Children". The project is being carried out longitudinally over three years (1994-1997) at the department of Pediatric Neurology, Tampere University Hospital. The aims of the project are to study the early development of disabled children, to develop assessment methods, early

habilitation services, and co-operation between families and professionals. The project also has multidisciplinary goals. One of them is to develop a play diagnostic method for the clinical use of pediatric professionals. For this reason the research project is also called the Play Project.

Sample

The target group consists of 61 disabled children aged 0 to 7 years who regularly visit the department of Paediatric Neurology, Tampere University Hospital for assessment and intervention. The group was selected at random from the risk children born in 1987-1994 and who are under the care of the department of Paediatric Neurology. They were all born as risk children with varying aethiological background.

Table 1: The aethiological background of the Play project children (N=61).

Aethiology	fr
Periventricular haemorrage	9
Periventricular leucomalasia	20
Hypoxic-ischemic encephalopathy	7
Cerebral malformation	13
Other reasons (chromosomal anomalies, syndromes etc.)	12
	61

At the first evaluation the diagnoses were cerebral palsy (n=42), meningomyelocele (n=7) or delayed psychomotor development (n=12). The children's rehabilitation, mainly physiotherapy, was started during the first months of age. All children are under intensive pediatric and developmental surveillance. Developmental status is examined at least twice a year multiprofessionally, with formal tests, interviews with the parents and recording of the children's play behavior.

The sample is divided randomly according to the principles of clinical experiment into the experimental and control group. The experimental group consists of 22 children aged 0 to 3 years and the control group of 39 children aged 1 to 7 years. Intervention consists of inpatient play monitoring and interventions until 36 to 72 months of age.

Data collection

Two methods of collecting data were used: the formal tests, and the video-taping of play behavior in hospital.

Cognitive development was evaluated using standardized psychological tests (Bayley Scales of Infant Development, Griffith Mental Developmental Scales, WPPSI or WISC-R). Motor functioning was assessed using a gross motor development scale created for the Play project (Seppänen et al., 1995).

Play activities were videotaped using both unstructured free play sessions and structured play situations. In the unstructured play session, lasting for 15 minutes, the mother was playing freely with the child. In the structured play session one of the therapists played with the child for 15 minutes using the toys and the games chosen for this purpose. Both play sessions took place in the hospital. In the structured play session, promotion of play behavior was used systematically. Different levels of enhancement were used, which took into account the degree of disability of the child. Gross motor functioning was measured, besides the formal test, using observations from the video recordings.

The level of play activity was assessed from the videotapes using assessment schedules developed for this study. The method is based on the empirical work concerning the development of symbolic play among nondisabled children (Belsky & Most, 1981; Vondra & Belsky, 1991; Nieminen, 1991; Lyytinen, 1990, 1991). In addition to play level the spontaneous and assisted motor functioning, communication, linguistic expressions and interaction of mother-child dyads were assessed from the video recodings.

Results

Preliminary results are presented with respect to the relations between the play performance and developmental status of three children. In figures 1-3, examples are given of the development of the mental, motor and play functions of the children.

The first example (Figure 1) is a girl, suffering from meningomyelocele, whose development is presented between the age interval of 32 months to 40 months. During that time her developmental age has increased from 21 to 23 months. Her gross motor function is well developed. She can walk forward independently holding on with the arms.

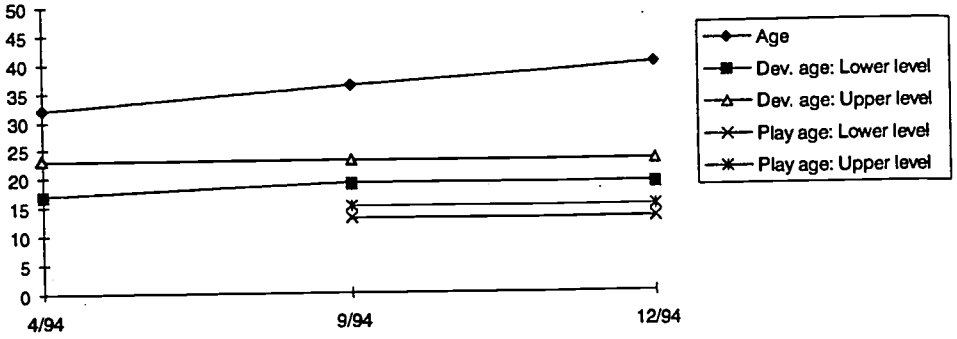

Figure 1. Mental state and cross-motor functioning of child with mental handicap.

Variation in her skills is approximately four months, her less developed abilities being speech and visuomotor integration. She suffers from hearing loss and wears hearing aids in both ears. Her play behavior is simple pretending. First steps in the dimension of decentration have been taken. The level of play matches well with her linguistic and conceptual stage.

The second example (Figure 2) is a boy, suffering from a spastic type of cerebral palsy, whose development presented here concerns the age interval from 23 to 35 months. His developmental age has increased from 14 months to 24 months. His play behavior has developed along the dimension of decentration. He can play simple pretending and manipulates toys adequately. The play behavior and cognitive abilities are enhanced by computer-aided games. The Computer is equipped with a touch-screen.

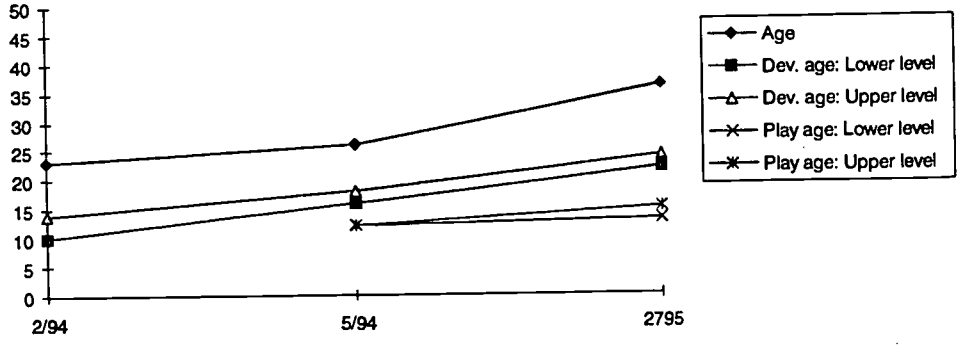

Figure 2. Mental state and cross-motor functioning of child with moto disability.

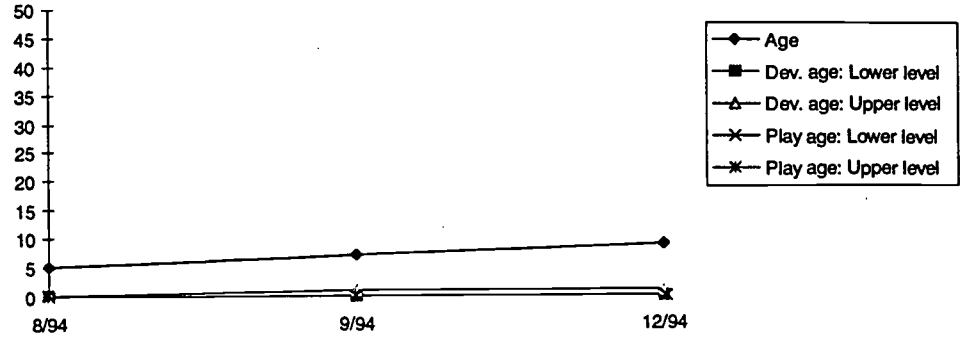

Figure 3: Mental state and cross-motor functioning of severely disabled child.

The third example (Figure 3) is a boy whose mental and motor functions are severely damaged due to periventricular leukomalacia. He is blind. The recording interval presented here consists of age 5 to 9 months. His developmental age increased during that time from 0 to 1 month. He can't move by himself. He has no grasping movement at all. The tactile sensitivity in his upper limbs is deviant. He likes to be in interaction with other people. Basal stimulation exercises are used a lot. His hearing ability is so far unclear.

These children were examples of the 22 children in the experimental group of the Play project. Their play development will be followed intensively during the coming years.

The individual variation among the disabled children is extensive. Also the variability in the skills present at any developmental level is remarkable. Usually the less developed cognitive skills are visuomotor integration and visuospatial skills. However, the developmental profile is dependent on the type and severity of the disability and additional disorders.

Most of the Play project children are progressing in their play activities and in mental as well as in motor functioning. There are, however, seven children in the experimental group who show very little progress in play activities - they are severely mentally disabled and have severe motor handicap. The level of these children's mental development as assessed by the observation of their child's play activities was lower than the developmental age measured by the psychological tests. The capacity of the child's gross motor functioning affects play development: the better the gross motor functioning the higher the level of play.

Conclusions

There are great individual differences in the play activities of disabled children. Children with mental disability or retardation develop play activities much more slowly than children with cerebral palsy. Preliminary results suggest that disabled children exhibit a similar pattern of developmental play sequence to that of nondisabled children (Lyytinen, 1991; Nieminen, 1991; Fenson, 1984). Decentered play acts were the first and most common forms of pretence. The theory and empirical data concerning the development of symbolic play gives a firm base for early psychological habilitation of young disabled children.

The preliminary results show the benefits of the play observation method in assessing the mental development of the disabled children. The play observation method has proven to be useful for professionals (psychologists, physiotherapists, occupational therapists, nurses and speech-therapists) in evaluating the child's developmental level and functioning in a multidisciplinary team in co-operation with the parents. It has also been practical in planning the home-based ecologically valid habilitation together with parents and home rehabilitators.

The preliminary results presented in this article, concern the assessment of disabled children. In the Play project an effort is also being made to advance the habilitating practices for disabled children. The experimental group has received inpatient play interventions which will continue in the coming, until the children are 36 to 72 months of age. The theoretical basis for therapy through play has also been developed. Results concerning the effectiveness of the play interventions are, however, not yet ready. Development of habilitation methods using play as a tool for promoting the play behavior of handicapped children is the theoretically and empirically challenging next step of the Play project.

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