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There's Something In My Way! A New Tool for Assessing Blind Children's Sense of Space

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Introduction

In the first months of their lives, blind children's psychomotor development is similar to that of their sighted peers, until there is time for them to learn to crawl and confront the problem of moving around on their own, time to get to know the surrounding space (Nielsen, 1991). Research shows that this is the time when in blind children the rate of expansion is significantly hindered by their fear of space (Karga, 1998). It is a concept they are not able to grasp, as they have no visual control over it. Everything runs smoothly as long as the immediate surrounding is within the reach of the hand, or within the span of the bodily movements of the baby. Open space, however, is tantamount to the need for moving around, the need for taking the risk of stepping into the unknown.

Research (Fraiberg S., Siegel B.L., Gibbon R., 1966) confirms that children begin to move around of their own accord as soon as they are able to reach for remote objects and locate them by sound. The ability to recognise specific sounds is developed around the time the child reaches the age of 1 year. It is also at that time that children undertake attempts to reach to the source of the sound, but the full competence at the task comes only 3 to 6 months later. It is a critical time for the development of a child's psychomotor functions, and any hindrance may affect the process of development badly. With blind children, around the first weeks of their 2nd year of life, the pace of psychomotor development is significantly reduced or even brought to a temporary halt for a space of several months, if not for longer (Orkan-Lecka, 1999). Scientific data have it that a hold

up of three or more months in a child's development within the first two years of life is always an alarming symptom (Czochanska and al, 1991).

Warren (1994) pointed to a couple of other important factors:
1. the physical condition of the child's body (especially the muscles)
2. visual faculty
3. the capacity of other senses
4. the ability and opportunity to move.

With regard to the problem of getting past obstacles, the level of cognitive development is also essential, including recognizing the solidity of objects by sound and learning means-end behaviour (Orkan-Lecka, 2006).

The following tool of diagnostic research has been created as a part of my doctorial dissertation entitled "Developing the sense of space in young blind children".

The organisation of the study is such as to find out about the behaviour of visually impaired children at the time when they begin to move around on their own and learn about the surrounding space. The primary objective is to determine how young blind children get to know the concept of open space, to see how they behave when they come across obstacles, in order to finally establish what kind of assistance they might need and when is the proper time for providing it. The diagnostic study in turn forms a basis for a programme of assisting the blind children's development to efficiently help them acquire the confidence they need to move around on their own.

Stages of diagnostic research

1. Interviewing the child's parents
2. Analysis of the medical data
3. Analysis of the psychological and therapeutical data
4. Initial diagnosis –
    a) diagnosis of visual functions
    b) diagnosis of cognitive functions (unless the child has undergone one recently)
    c) touch preference test
    d) sound-based solidity awareness test
    e) diagnostic tasks
5. Recording the diagnosis results in a descriptive report pointing out the child's difficulties in moving around and getting past obstacles
6. Establishing the forms, techniques and methods to aid the child's development; determining the child's strengths and weaknesses

a) establishing precise objectives for the consecutive stages of the child's development
b) choosing the appropriate methods and techniques to achieve the assumed objectives and aid the child's development
c) suggesting a specific set of activities, suited for the child's needs, abilities and preferences

7. Discussing the results of the assessment and the suggested methods of aiding the child's development with the parents
8. Implementing the development assistance programme
9. Checking the effectiveness of the programme with a post-test
10. Discussing the results of the programme with the child's parents
11. Preparing a collective report of the programme for scientific research purposes

The following tools have been used to determine how young children with sight disabilities become familiar with the concept of space and what methods they use to get past obstacles:

A. Examination of the child's touch preferences

Objects:

1. hard
   - smooth and cool to touch: a plastic ball, aluminium foil, plastic or metal beads
   - smooth and warm to touch: a wooden ball, a wooden chopping board, wooden beads
   - rough and uneven to touch: an abrasive, a roughly-surfaced ball, a rough nail brush
2. soft
   - smooth and silky: a silk scarf, a soft ball, a slightly blown-up balloon
   - fluffy: artificial fur, a feather duster
   - powdery: flour, rice, dried peas

The result of the examination is then recorded collectively in a chart according to the key below:

The scale of assessment	The child's behaviour
+ +	The child actively pursues the object, reaches for it, wants to touch it and play with it, places the toy in the mouth, and enjoys manipulating it.
+	The child needs time to get accustomed to touching the object;

	initially may withdraw the hand when feeling it, but after a while reaches for it, holds it and plays with it.
0	The child is indifferent towards the object, doesn't reach for it and refrains from touching it and cannot be encouraged to manipulate it.
–	The child doesn't want to touch the object; at feeling it, the child winces and becomes defensive.
– –	The child evidently avoids touching the object, cannot be encouraged to hold it, pushes it away, may even cry after touching the object.

B. Assessing the child's awareness of the solidity of an object (based on sounds).

The following tasks included in this examination have been designed according to Selma Fraiberg's criteria:

1. touch only
2. touch and sound combined
3. sound only

This examination requires using a plastic ball or a soft ball (both with a bell inside), selected according to the given child's touch preferences. Then the result of the examination is recorded as a number (1, 2 or 3) on the observation chart, according to the description below.

1 – the child is not interested in touching the object, does not attempt to reach for it.
2 – the child shows interest in touching the object: listens to the sound, moves the fingers, one or both hands, but needs help with proper aiming at the object and reaching it.
3 – the child shows interest in touching the object, can aim at it properly and is able to get hold of it without help; touches and manipulates the object without inhibitions.

The "comments" slot is for recording any help or hint that the child might have received (words of encouragement, moving the ball closer, et c.)

Task	**Child's Reaction**			**Comments**
Touch	1	2	3	
Sound	1	2	3	
Touch and sound	1	2	3	

C. Establishing the level of the development of the child's motor abilities

The examination covers the following range of skills and motor abilities of children:

I. Push-up position and crawling
   1. The child moves around rolling.
   2. The child uses hands to prop their body up and move forwards.
   3. The child props themselves up with hands and uses legs to push themselves from the ground, moving for about 30 cm.
   4. The child crawls 30 cm forwards and backwards.
   5. The child moves around otherwise.

II. All-fours position and moving on hands and knees
   6. The child adopts an all-fours position.
   7. The child moves on all fours.
   8. The child reaches out for objects while on all fours.
   9. The child moves over low obstacles on all fours.

III. Standing up
   10. The child adopts a standing position.
   11. The child stands unaided.
   12. The child plays with toys while standing.

IV. Walking
   13. The child walks with help.
   14. The child walks unaided.
   15. The child is able to perform other functions while walking.

V. Getting past obstacles
   16. The child gets past obstacles.
   17. The child gets through between two obstacles.
   18. The child walks onto flat objects.
   19. The child walks onto higher objects.
   20. The child moves up and down stairs.
   21. The child moves obstacles out of their way.

The test describes a diagnostic procedure, taking into account the current surroundings, the child's behaviour and the objects used for the tasks. It is quite flexible, as it includes the possibility of altering the conditions or the procedure of the test, replacing the suggested objects for various reasons and lending help to the child if need arises.

The results are respectively recorded on the research chart by circling the adequate number, according to the child's level of performance in each of the tasks. Any help the

child might have received (holding up, propping up, verbal encouragement) should be noted down in detail.

Sample diagnostic task

Skill:
Getting past obstacles

Instructions:
The place where this task is conducted should be safe and familiar for the child. A music box should be placed behind an obstacle or up a few steps. The child can be encouraged by means of speech or other pleasant sounds that would trigger the want for touching the source of the sound. The manner of moving (walking) is irrelevant for the purposes of the test. The child's behaviour is monitored and noted down on the observation chart, according to the descriptions provided. If the child receives any help (holding up, verbal encouragement, propping up), it should be noted down as additional comments.

1. The child gets past an obstacle (an armchair)
    1. is unable to get past it
    2. gets past it but requires help (what kind of?)
    3. gets past it unaided

2. The child goes through between two armchairs
    1. is unable to get through
    2. gets through but requires help (what kind of?)
    3. gets through unaided

3. The child walks over a rough-surfaced shoe mat on the floor
    1. doesn't want to step upon it, nervous reaction
    2. tries to explore the object, needs help to get on it (what kind of?)
    3. gets on it unaided

4. The child walks over a soft rug on the floor
    1. cries upon stepping on the obstacle, doesn't want to walk on it
    2. tries to explore the object, needs help to get on it (what kind of?)
    3. gets on it unaided

5. The child walks over a smooth-surfaced mat on the floor
    1. cries upon stepping on the obstacle, doesn't want to walk on it
    2. tries to explore the object, needs help to get on it (what kind of?)

3. gets on it unaided

6. The child walks over a massage rolling pin
    1. doesn't step on it
    2. steps on it but requires help (what kind of?)
    3. steps on it unaided

7. The child climbs on a low couch
    1. doesn't climb on it
    2. climbs on it but requires help (what kind of?)
    3. climbs on it unaided

8. The child climbs up stairs
    1. doesn't climb
    2. climbs up crawling
    3. climbs up using the wall or the railing for support

9. The child climbs down stairs
    1. doesn't climb
    2. climbs down crawling (legs first)
    3. climbs down using the wall or the railing for support

10. The child moves a box
    1. doesn't move it
    2. moves it with encouragement or help (what kind of ?)
    3. moves it unaided

Summary

It has been confirmed in numerous scientific studies that psychomotor development and the ability to move without external aid are seriously handicapped in blind children. The diagnostic tool I described may help to determine the specific cause of these problems in a given child. The whole diagnostic procedure – including the analysis of medical documents, interviews with the parents and, if necessary, diagnosing cognitive and visual functions – constitutes a reliable foundation for creating a development assistance programme, well suited for the child's needs and the family's situation.

Originally, the test was designed for blind children. Nevertheless, it can be modified according to the needs and condition of the child tested, whether the child is completely sightless or with low vision. If a partially sighted child is being tested, it is worth recording what visual conditions of the surrounding prove helpful in performing the tasks.

It must be stressed that this is an experimental version of the programme and although the principles have been discussed in detail with specialists (psychologists, teachers, O&M instructors, physiotherapists and SI specialists), the test itself should be executed on a large population of young blind children. The preliminary results of the test will be presented during the conference.

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