

Thinking about thinking

How play develops into thinking

An extension of an article for Information Exchange

We tend to suppose that thinking involves using words, perhaps this is because whenever we discuss our thoughts, we use words to express their meanings. However we all know that there is a lot of feeling, evaluating and reacting, which goes on before we get to put our thoughts into those words.

It fascinates me to think about how children learn to think; they obviously do so before they can talk or even before they understand what is said to them. You only have to look into typical babies eyes to see its mind is racing - making sense of you - reacting to all it sees hears and touches, or to the effects of its movement and position.

As adults, perhaps because we are hide bound by our ideas about verbal thinking, it takes a leap of imagination for us to realise that children's understanding of the world grows through their memories of actions and movement – indeed their actions are their thoughts and their expressions.

Schema

Literature about early childhood learning describes the beginnings of thinking as springing from the child's memory of sensory interactions, and reflex responses - repeating remembering and developing increasingly intentional actions. Psychologists have noticed patterns that children repeat, and combine to become more complex actions – they call these patterns 'schema' .

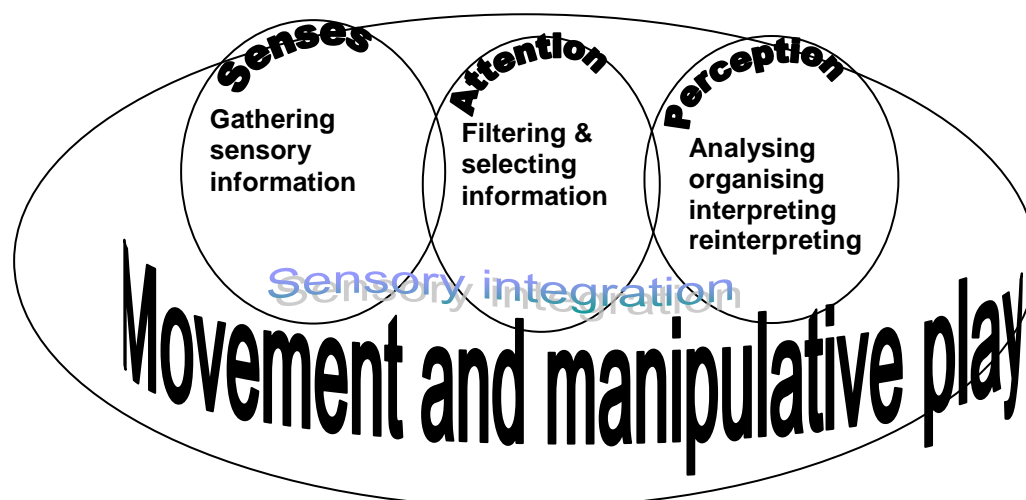
- Because the children remember these actions psychologists suggest that because they are - non verbal memories of experience the actions are actually 'ideas'
- So when children are using these actions- to experiment or affect things they are in effect 'thinking' through action.
- As they observe the effects of their actions they modify their ideas. They refine and combine – remember and develop expectations, through continuous exploratory activity. – Play.
- If their expectations are not matched – they are alerted - very interested – or upset
– This is the learning zone.

Spontaneous play

For the typical child play is a spontaneous activity, satisfying what seems to be an active will to explore. It is exhibited in the ceaseless curiosity, investigation, manipulation and practice that is part and parcel of the development of body skills, and in developing ideas

Before they are able to explore and play children must develop movement and manipulation skills that combine with the development of

- sensory skills,
- attention
- and perceptual awareness,



During earliest play infants develop from reflex responses to intentional actions

- At first, children's play is solitary manipulation and movement, as time progresses they usually develop towards more social dimensions involving developing awareness of the actions of other people and developing communication skills
- Initially social play entails playing alongside others, without mixing,
- Later it involves becoming engaged in associative and cooperative play with others, through which the rules of coexistence are experienced. This gives children the chance to develop social competence and supports the development of communication and thinking skills .

Staff working with very special pupils will often need to support their pupils to develop spontaneous activity in ways that are not necessary for more typically developing children. Staff may also need to maintain such approaches with age appropriate changes throughout the school life of some pupils.

Balancing support and independence

The art of teaching includes balancing direct support and modelling with promoting independent learning.ⁱ The works of Jan Van Dijkⁱⁱ and Barbara Milesⁱⁱⁱ are important to help us understand support – Whilst the works and ideas of Lilli Nielsen^{iv} are inspirational to us in developing independence and active learning. Though we now almost take her ideas for granted the principle of the 'little room' and the resonance board were notions of simple genius that have enabled us to motivate independent active learning for many profoundly disabled infants. When observing such pupils in these active environments we can often see them beginning to experiment with movement and develop schema – chipping away at their enormous physical and sensory barriers to learning. As they learn to control and repeat patterns of an arm movement today they are contributing to the later possibility of pointing, counting, mark making or even writing in the future.



The BeActive Box is based on the 'Little room' developed by Lilli Nielsen for blind babies or infants. Objects that feel and sound can independently come to hand encouraging the child to develop independent play experiencing object permanence , cause and effect etc.

It can

Find it at the RNIB online shop

Patterns for learning – Developing Schema

One of Lilli Nielsen's important premises for us was that we should always look towards what typical children do in order to help us see relevant learning for our very special pupils and there are many fascinating books written for early years practitioners about schema, these hold a wealth of information for anyone interested in how special pupils may develop. Important authors to look for include Chris Athey,^v Cathy Nutbrown^{vi} and Tina Bruce^{vii} .

These important educators have all documented how typical children extend the early useful actions which they develop as babies, from reflexes or fundamental interests, to become patterns of exploration.

Athey illustrates how from the early roots of a small number of major schema:

- Vertical and horizontal movements
- Circular movements
- Enveloping or containing.

Children develop interest in following activities which can be seen not only in typical children's mark making but also permeate through their play and speech.

- Dynamic vertical - up and down movements
- Dynamic horizontal – back and forth and side to side,
- Dynamic Circular - interest in round movement and rotation
- Going over and under
- Going round a boundary

- Enveloping and containing space
- Going through a boundary

These in turn extend to exploring ideas such as height, width, space, rotation rolling, position, covering, hiding, finding, fitting, etc. The list extends rapidly as actions and ideas combine and are experimented with. Some extensions and variations on the list above might include:

- **Connecting** – joining and putting together, toys trains etc. Using strings ropes etc to tie things together. Making tracks and routes. Drawing connecting lines. – These help children to understand connectivity, sequences etc.
- **Dabbing** - First in food play, later in drawings. Initial haphazard and random representations develop into more ordered activity and become more accurate.
- **Enclosing** - At its earliest this may include putting the thumb into the mouth. Placing and fitting things in enclosed spaces, including themselves . Filling and emptying and becomes related to estimating size and volume. Collecting items relates to categorisation and making sets.
- **Enveloping** children may wrap things or themselves. Hide or put things in boxes with covers.. They may enjoy going underwater or seeing others. Enveloping explores concepts of object permanence, constancy and conservation.
- **Moving and transporting** - Children may move objects or collections of objects from one place to another, experiencing progressive changes of quantity, conservation. space direction and position, experiencing language of position and change

Look for it

Armed with awareness about these processes watch your special children's responses or play. You may see particular movements or actions that they like or are interested in. Ask yourself can you provide environments or resources that capitalise on what they do, or encourage or challenge them, or move them to another use or level.

Whilst an important element of play is in discovery through independent activity many children with special needs may benefit from seeing others play, modelling and imitation are important teaching strategies.

Children of different ages or disabilities may be developing at different levels but actions related to various schema may still be observed occurring in different ways. They will be observable right across the ability range from children developing control of reflex movements to those developing higher cognitive skills

For example interest in horizontal schema may include:-

- A young pupil with profound physical difficulties learning to combine horizontal visual tracking and reaching in an environment like Lillis little room or a Be active box.
- Whilst another pupil may be learning to arrange rows of objects, or make sequential marks.
- Or a pupil on the autistic spectrum may have developed a repetitive obsession with making linear arrangements – that needs to be connected to other activities such as collecting, or transforming or grouping or exchanging.

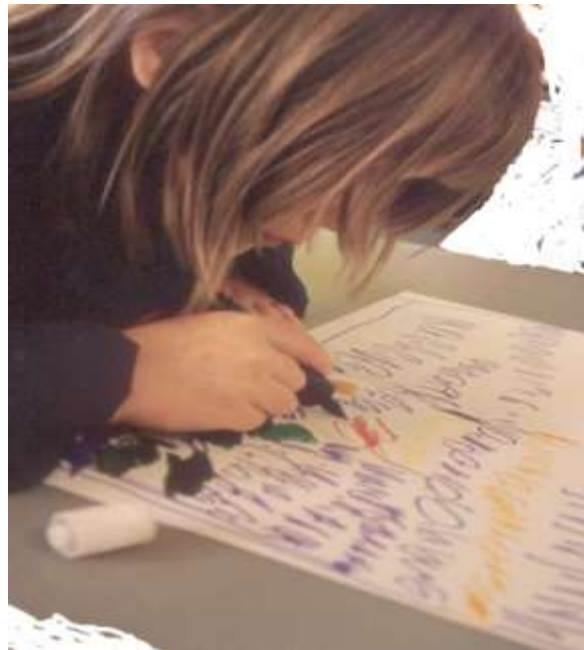
Observations that help us identify patterns, or see reasons and direction of activity, are of great help to us both as means of planning and of helping us identify pupils progress.

The descriptions in the lists above are brief, those of you who are interested may wish to find out more from the books listed .

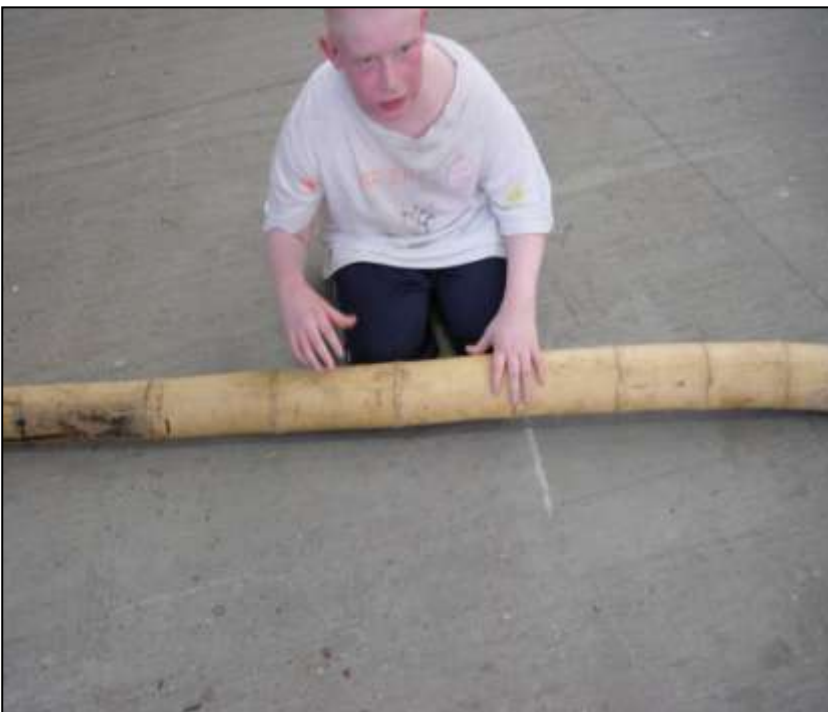
Meanwhile if you tune in to thinking about learning in this way the children's activities are bound to fascinate you .



Adrian enjoys feeling inside the singing bowl experiencing its roundness and its ability to contain. . He is becoming interested in putting things into containers

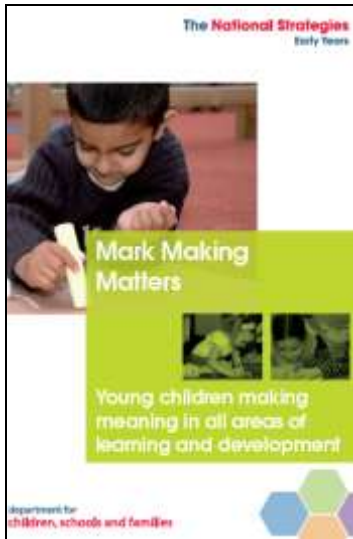


Hayley moved from random dabbling to sequential mark making over a period of a year, now her marks are arranged in lines and are taking on more controlled forms.



Ed is finding an alternative expression for his usual 'rocking' – he enjoys rolling the bamboo log back and forth he is finding out he can affect and control movement as well as experiencing the properties of curved surfaces. Enjoying rhythm he sings along with the regular action of his activity. – The repetitive sounds reflect the repetition of the rolling. This was later extended when the teaching assistant joined in his play and they took turns rolling the bamboo to each other

Some schema that can be seen in children's play activities	
Circular motions and marks	Circular motions and manipulations are with the child in reflex activities from the very beginning, with a babies circular arm and limb movements . They develop and refine later include rolling, spinning, rotation turning, radials and arcs, all of which contribute to positioning and orientation schema Running round and circle games contribute to typical children developing understanding of contiuity, repetition. cycles of activity. Mark making circles leads to representation and symbolic drawing.
Vertical movements and marks	Reaching or moving up and down feeling verticals uprights such as walls poles. .Understanding height and geometrical planes and space Climbing and steps contributes to understanding incremental sequences . up and down higher and lower. Vertical mark making develops towards understanding representation of space and increasing quantities.
horizontal movements and marks	Exploring planes such as floors tabletops rails laying down,pushing along tracking and following .Arranging lines. Sequences forward backward making connections and progressions. Combining verticals and horizontals lead to interest in grids and diagonals . understanding position placement and coordinates
connecting	Children might like to connect and put things together, join toys, trains bricks. Strings, rope, wool and so on may be used to tie objects together. It illustrates sequencing of things and events . May relate to following tracks and understanding routes and journeys. Connecting offers opportunities for itemising ordering , counting introducing the number line. Childrens first ideas about addition come from experience of connecting and collecting – which naturally also leads them to explore separating and taking away . Sometimes children's drawings and paintings show a series of linked parts and relate to understanding interdependence.
Dabbing	Often used in food play later in paintings and drawings sometimes haphazardly later developing interest in order. Many repetitions may be stimulated by the impulses of the act of making the mark. Relates to experience of rhythm sequence increase. Sometimes children associate this with random dabbing representing very large numbers – 'hundreds' or 'millions'. More systematic dabs may begin to be used to begin represent numbers they know for example, eyes, or animals in a field that they draw. These are precursors to tally marks which can be used to record progressive events or quantities.
Enclosure	At its earliest this may include putting the thumb into the mouth, It is related to filling and emptying and becomes related to estimating size and volume. They may have an interest in placing and fitting things in enclosed spaces, including themselves, or may be interested in the box – or in posting items into drawers, letter boxes or money . Understanding insideness. A child may build enclosures with building blocks, boxes. Sometimes they are named as objects e.g. buses, houses, fields, and things or people put in them, sometimes left empty. Enclosure may become related to understanding about more and less, and differences of quantity, when groups of items are enclosed in containers drawers or drawings. It may also be a part of learning about sorting and classifying. Enclosure is related to drawing shapes and collection or demarcation of sets. In graphic form an enclosing line is often used to frame drawings. When children are exploring this schema, sometimes they fill the enclosure or leave it empty and in this way are expressing understanding of 'nothing'
Enveloping	As an extension of enclosing children may wrap things up or put them in boxes with covers or lids, they wrap themselves or others in a blanket or hide in boxes. They may enjoy going underwater or seeing others submerge. Paintings are sometimes completely covered over with a single colour wash, turning a day picture to night. Enveloping explores concepts of object permanence, constancy and conservation. It illustrates that things can still exist when they have gone out of sight. It can be used to challenge memory and promote the use of imagery as a memory tool.
Moving and transporting	Children may move objects or collections of objects from one place to another , the processes may help them to experience progressive changes of quantity , adding and taking away , distribution and sharing , change and conservation of quantity, . space direction and, language of position and change



Mark Making matters – Young children making meaning in all areas of learning and development.

DCSF ref: 00767-2008BKT-EN

is a DCFS publication that explores the role of mark making in the development of children's thinking skills it includes discussion of schema that children use as they are beginning to understand making representations

<http://nationalstrategies.standards.dcsf.gov.uk/node/132558>

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- ⁱ A summary of the ideas of van Dijk – Miles and Nielsen can be found at <http://www.tsbvi.edu/Outreach/therapy/theoretical.htm>
- ⁱⁱ Van Dijk's Learning Theory for Learners who are Deaf/Blind (From "Overview of the van Dijk Curricular Approach," available through NCDB website <http://nationaldb.org/ISSelectTopics.php?topicCatID=7>
- ⁱⁱⁱ Barbara Miles <http://nationaldb.org/NCDBProducts.php?prodID=47>
- ^{iv} Lilli Nielsen <http://www.tsbvi.edu/Outreach/seehear/fall03/lilli.htm>
<http://www.sfbaymarketing.com/clients/lilliworks/one/>
- ^v Athey, C (1990) Extending Thought in Young Children: A Parent-Teacher Partnership. Paul Chapman, London (second edition out April 2006)
- ^{vi} Nutbrown, C (1999) Threads of Thinking (second edition). Paul Chapman, London
- ^{vii} * Bruce, T (2005) Early Childhood Education (third edition). Hodder Arnold, London