
A Learning Story



CARA'S EXPLORATION OF SCHEMAS AND MATHS



A Case Study by Flávia Ribeiro

Flavia completed her Teaching Degree in Early Years at Universidade do Minho in her home country of Portugal. Flavia has worked as a Teacher and Family Worker in nursery at Pen Green for the last 18 years. Flavia has a passion for children's schematic play and becoming attuned to children, understanding their innate interests.

Introducing Cara



Cara is four years and 5 months. Cara has been attending our Nursery since September 2021, but had previously been in our baby and toddler provision since the age of 2.

When Cara first started in nursery, she was really interested in sensory activities she displayed strong enveloping and containing schemas. This pattern was visible in the way she explored water, play dough, shaving foam and other sensory textures. The following Learning Story is a reflection of Cara's current interests and concerns, her play is very much focused on exploring symbolically but continuing to explore her main cluster of schemas which are enveloping and containing and more recently transporting and trajectory. Cara, as described by Athey 2007, "is combining schemas to form partial concepts," in particular mathematical ones.

CARA'S EXPLORATION OF SCHEMAS AND MATHS

Cara, you have a keen interest in playing with babies. I have been observing you and finding it fascinating, how so much of your baby role play revolves around early concepts of quantity, capacity, size, estimation and area.

You like to choose the small babies, we have a significant amount of them at the moment, they are all similar and equal in size. You like to gather a few of them and arrange them neatly in lines, whether to transport them or to simply put them in bed. You like to try and fit them all in the small prams, arranging and rearranging them until they all fit. You like covering them in blankets, doing a great job of assessing and estimating how the blanket will fit and cover them all.



Observation shows there is also an element of role play, when you are exploring, you have gathered enough knowledge to know and act out how babies are looked after, but you are also learning and exploring early maths concepts such as quantity, size, fit, area, conservation of amount. This hands on approach and intrinsic motivation to learn will hopefully give you the foundation to engage in more complicated maths as you move through the educational system.





Cara I love this picture I just managed to capture it. You spent some time arranging your babies on a blanket as if they were in bed, and proceeded to neatly cover them with another blanket. This was all done with such care and precision, combining your interest in enveloping with early mathematical knowledge of estimation of size and area.

What could we provide you with to extend this:

I wonder if you would like to try wrapping things up with wrapping paper, different size envelopes, Russian dolls or seriated boxes. You might also enjoy the parachute outside and stretchy fabric to explore through dance and movement.



Glossary

SCHEMA

Schemas are 'repeated patterns of action' that children demonstrate when they are exploring the world and trying to find out how things work.

Why is it important to be aware of schemas? We can support children's natural exploration of the world more appropriately if we can recognise which schemas particularly interest them. Children learn so much at home through playing and exploring their environment, if you recognise that children are repeating actions (or schemas) you can provide a stimulating environment to encourage this.

Research carried out by Chris Athey found that 1) involving parents and sharing schema theory with them and 2) identifying schemas and providing content/resources to encourage children to explore both had long term effects on children.



ENVELOPING SCHEMA

ENVELOPING Can most commonly be recognised as a child covering themselves, objects or a space often with tea towels or scarves or blankets. Cardboard boxes may also be popular play materials, for example children may enjoy putting their toys in boxes and closing them, or even getting in boxes themselves and closing them.

More examples of Enveloping schematic play:

An interest in tents, tunnels, dens, boxes; Building fences or barricades; Creating a train track and putting toys in the middle.



Glossary

CONTAINING SCHEMA

CONTAINING Refers to a child's interest in putting themselves, objects or materials into different containers. You may notice that your child(ren) is interested in: putting materials such as sand, mud, play-doh into containers; pouring water into watering cans; climbing in to boxes themselves, or drawing boxes/circles around things.

In order to support this schema you can provide them with different sized containers (boxes, jugs etc) and provide access to materials such as water, sand, play-doh, pasta, grains/rice.



TRAJECTORY SCHEMA

TRAJECTORY Lines that are moving, like a jump. These lines can be vertical 'up down', horizontal 'side to side' or oblique 'at an angle'. Trajectories can leave a mark or trail, that we refer to as a line. You make the line by making a trajectory movement. Young children often place objects in a line. The line is the 'figurative' aspect of the schema, whereas the movement is the 'dynamic' aspect.

Some examples of trajectory include: Climbing up things and jumping off, throwing things repeatedly, interacting with things that are already moving (i.e. putting their hand under running water), stacking items or lining them up.



Glossary

TRANSPORTING SCHEMA

TRANSPORTING Refers to when children carry objects or enjoy being carried from one place to another a buggy or shopping trolley maybe a favourite toy. Children who are enjoying transporting will constantly find and gather things to move and ways of moving them around, e.g. using bags.

More examples of transporting schematic play include: Carrying toys with them; playing with trucks/cars using objects to transport toys such as: buggies, shopping trolleys, baskets & bags; playing with bikes/scooters.



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