



PART 1

YOUNG CHILDREN LEARNING

Our knowledge of young children's cognitive development has been extended by the early work of Piaget, Vygotsky, Isaacs and other 'Great Educators' who, in different ways, set out to illustrate the characteristics of children's thinking.

The legacy of observations by those who have worked with young children in the past shows how, when enquiring minds are fostered, some quite incredible questions can be asked by children and sophisticated learning takes place.

At the heart of this book are observations of children made over a period of time. It is sustained and patient observation which offers new insights into the way children operate in, see, and think about the world. Observation-based, reflective practice can be inclusive practice, for it provides those working with young children with fundamental information on which they can base their spontaneous as well as their planned work with children according to what those children know and can do.

Chapter 1 gives some examples of children trying to make sense of experiences, and to reason why things happen. Chapter 2 considers some of Athey's work and deals with some questions which educators often ask about schemas and young children's learning.





CHAPTER 1

THINKING ABOUT YOUNG CHILDREN LEARNING

A 3-year-old sits on the edge of a river bank, her toes just touching the gently flowing water. She watches the insects skimming the surface, stares intently at a tiny fish which swims near to her feet. For some 20 minutes, this little girl watches patiently. No one knows what she is thinking, but there is no doubt that her diligent study of the environment around her is something which takes up the whole of her being. No one tells her to study the water and the wildlife around her, no one asks her to sit still, to be quiet and to watch. Her interest is fuelled by a natural and instinctive curiosity about the world around her.

Adults who teach young children must remain constantly aware that young children are capable of being patient observers, especially when given space and time to do so. Young children cannot be taught effectively if planned learning is always artificially divided into falsely defined compartments called 'subjects'. Just as the child on the river bank studied intently the experiences around her, children will explore scientific ideas, learn about mathematics and develop their language while engaged in many different experiences in home and community situations as well as through experiences specifically planned for such learning in early education settings.

In the following examples, children are learning through real and immediate experiences. They are all playing or working with water, and these observations

show the immediate and engaging experience of water in providing playful learning opportunities. Three observations follow: Zoe (aged 4), Ashaq (aged 6) and Karmen and John (aged 8 and 7).

Zoe aged 4

Zoe was playing in the water trough at the nursery. She was experimenting with a jug and water wheel, spending a considerable time filling the jug, pouring the water over the wheel and watching it turn. She poured water at different speeds and from different heights. Her teacher watched and eventually asked: 'Can you tell me what is happening?' Zoe looked at her and began her explanation: 'The wheel doesn't like to get wet, so it runs fast to get away from the water. When all the water is gone, it stays still again!' Zoe knew that the water made the wheel turn but ascribed attributes of thought and feeling to the wheel. Early experiences of the scientific principles of force, gravity and power are present in this example, as well as the beginnings of reasoned thought. Zoe was beginning to grapple with ideas of speed and of cause, function and effect.

Ashaq aged 6

Ashaq was watching his mother using a jet spray at the garage to wash her car. He observed intently for some time and then asked if he could have a turn. After concentrating the jet of water on one muddy wheel and watching the dirt wash away, he said: 'If I put it nearer the dirt goes away faster. That's because the water hits it harder if it doesn't spray so far. If I spray a long way away then not all the dirt goes.'

This 6-year-old told his teacher about the car washing. She used jets, sprays and the advantage of a hot summer day to work with him to develop further this understanding and to extend his interest. Water flowed from the hosepipe in the yard outside the classroom as did questions of 'How?', 'Why?' and 'What if?' Ashaq made reasoned answers to all the questions the teacher raised. He also asked questions of his own. The principles of siphoning were mastered and the appropriate terminology was introduced by the teacher. A small group of children worked purposefully to create and solve their own water-oriented problems.

Learning does not begin and end in school. The visit to the garage with his mother opened up the child's thinking which Ashaq, with the help of his teacher, was able to build on with his peers in school.

Karmen and John aged 8 and 7

Karmen and John were at home in their garden bathing dolls and washing all their clothes. The dolls and clothes were covered in an ever-increasing amount

of soap suds. The children had rather overestimated the quantity of washing powder they needed, reasoning that the dolls were extremely dirty and so must need a lot of soap to get them clean. John decided to change the water and wash everything again, this time not putting in any more soap. The following conversation gives an interesting insight into the children's reasoning and understanding:

- Karmen: Make the water cooler this time, it disperses the bubbles.
 John: How?
 Karmen: Not sure, but it does, mum does that with the jumpers in the sink. It sort of pops them.
 John: Is it that cold water is too cold for them and it makes them pop?
 Karmen: Maybe, it's thinner and gets through the membranes.
 John: Brains! Do bubbles have brains?
 Karmen: No! Membranes! It's like an invisible sort of film, like a sort of skin thing to keep the air trapped, they have them on a programme on telly sometimes.
 John: How does the air get in there?
 Karmen: Well, it's the soap. Get the cold water now.
 John: How cold?
 Karmen: Cold! Don't put any warm in, though you could put a bit, tepid water, 'hand-hot' my mum calls it I think.
 John: Does that mean as hot as my hand?
 Karmen: It means you can put your hand in and it doesn't make it red hot or freezing cold so it hurts your fingers.
 John: I bet we could do it quicker than changing all this water.
 Karmen: How?
 John: Stick them all under the tap till all the bubbles run off then squeeze them!
 Karmen: Or! We could use that thing in the bathroom and give them a shower. That would work.
 John: I saw that on telly.
 Karmen: What, doing the washing?
 John: No, spraying the oil.
 Karmen: What?
 John: If you spray oil it breaks up, pollutes the environment and the sea, oil does.
 Karmen: Like if you get soap on your hair and use the shower to rinse it off. We'll do the dolls first, their hair is all bubbles.
 John: The particles bombard oil and hit it to break it up. Dad said.
 Karmen: Does oil have membranes?
 John: Don't know. Give me that jacket. Oil's not as heavy as water though. It floats on top. I saw that on telly too!
 Karmen: We've got brains!
 John: If it works we have. But I bet it does. My mum puts me in the shower on holiday!

Karmen and John were transferring elements of their knowledge gleaned from different sources, including their parents and the television, and using what they knew to try to solve their present difficulty. They were exploring, discovering,

checking out each other's meanings, predicting results, forming hypotheses and drawing conclusions. They played cooperatively and with intensity of purpose. Susan Isaacs' (1930, 1933) meticulous observations of children during her three and a half years at the Malting House School show how a rich environment and freedom to explore can lead children to form numerous questions which they are then motivated to find answers to.

As children get older and more experienced, if adults have spent time with them, extending their interests and explaining things about the world, stimulating their actions and thoughts into new areas and talking with them, children come to use different language and terminology to explain their reasoning. It is their language which indicates to us their grasp of meaning and their understanding. If children articulate their thinking, their parents, teachers and other educators are in a better position to help them to refine and further develop their ideas. It is important to take time to listen to and talk with children, to give them opportunities to share their hypotheses, ask questions and refine their ideas.

If we reflect on the use of language in the three examples of children using water, we see different thoughts and understandings. Four-year-old Zoe explained: 'It runs away from the water.' Six-year-old Ashaq observed: 'If I put it nearer the dirt goes away faster.' Seven-year-old John said: 'The particles bombard the oil and hit it to break it up.' Eight-year-old Karmen said: 'Membranes, it's like an invisible sort of film; like a sort of skin thing, to keep the air trapped.' If children have played in their earlier years with the stuff of the world (water, sand, mud and clay), they are in a better position to develop further concepts through these media (Hutt et al., 1989). Children who have had few encounters with these natural materials will need time to explore their properties and attributes so that they can then tackle other challenges and questions when they work with such materials.

Worries about children's safety and urban living now inhibit the freedom of children to explore their world. Beck (1992) in *Risk Society* argues that risk comes with modernisation, and as such must be either 'eliminated or denied and reinterpreted' (p. 26). Bauman (1993) discusses the view that a post-modern view of risk brings us to a new view of risk and crisis with new sets of rules to govern behaviour and thus to reduce risk. Yet, he argues:

Even if we abide by such rules scrupulously, even if everyone around observes them as well, we are far from certain that disastrous consequences will be avoided. Our ethical tools – the code of moral behaviour, the assembly of the rules of thumb we follow – have not been, simply, made to the measure of our present powers. (Bauman, 1993, p. 18)

Whatever we do, risk remains. We can seek to reduce risk in society, but we can never wholly eliminate it. In part, risk is generated by fear (as well as by fact). Füredi (2002) argues that risk has come to mean danger and the 'positive connotations traditionally associated with "risk-taking" have given way to

condemnation; consequently, in many situations, “to take risks” is to court social disapproval’ (p. 18). But young children need adults who help them to learn about assessing and taking risks. To learn about taking risks (just as the children who used Bunsen burners and lit bonfires in Isaacs’ day had to do) is to become more aware of oneself in the world, and better able to live and play safely.

Concerns for children’s well-being include fear of illness from polluted rivers, beaches and food, and of abduction or abuse. Other threats to children’s health and well-being centre around poor diet (Oliver, 2005), and concerns that the over-use of technology by children could inhibit their outdoor and creative play (Miller and Almon, 2004; Palmer, 2006). Adults who wish to support children’s learning now often bring the stuff of the world into safe, defined but falsely created boundaries. The vastness of the seashore and the expanse of the river-bank are reduced to small quantities of sand and water in specially designed plastic containers, and children often wear aprons to protect their clothing from wet and dirt. But an essential part of the learning experience is the process of getting sandy, dirty and wet! Instead of making mud pies in the outdoors, children use small quantities of clay in a confined space at an allotted time. The role of the adult in protecting the opportunities for learning and enabling children’s own ways of thinking and exploring is crucial. Children need the freedom to play and learn, and educators need to create opportunities which provide this freedom to learn in safe environments which, as far as possible, removes the inhibiting restriction which arises from exaggerated fear for children’s safety. The restrictions which are placed on children and the consequences of this in terms of their subsequent development were considered almost 40 years ago by Tinbergen (1976), who discussed the ways in which young children learn through play in their natural environments. Tinbergen suggested, even then, that society had inhibited children’s freedom to play and, just as young animals find their own way of learning, young children could do the same if they were in an appropriate environment. The concerns expressed by Tinbergen nearly four decades ago have now multiplied to the point where children’s freedom to learn is restricted and limited (often in the interests of keeping them safe) and their opportunities to play outdoors are, in many cases, being seriously threatened.

John Brierley’s contribution to our understanding of children’s brain growth and development provided insights for all who have responsibility and concerns for young children. Brierley asserted that the years from 0 to 5 are crucial for brain development and that the first 10 years are the years during which the brain reaches 95% of its adult weight. He wrote:

During these years of swift brain growth a child’s eyes, ears and touch sense in particular are absorbing experiences of all kinds through imitation and exploration. It is obvious that the quality of experience is vital for sound development. In addition to sensory experience, talk is as vital to human life as pure air. (Brierley, 1994, p. 28)

Recent scientific research suggests that babies and young children are born with the capacity to understand a lot more than was previously thought to be the case (Gopnik et al., 1999). Such studies have challenged long-held views of babies' 'ignorance' suggesting that babies, indeed, have an innate capacity from the moment they are born (Gopnik et al., 1999, p. 27) and confirms the importance of providing babies with novelty and stimulation in their environments (Brierley, 1994, p. 81). Bruner's 1960 theory of 'cognitive growth' suggested that environmental and experiential factors were influences on a child's development (Smith, 2002). Trevarthen's (1977) focus on the communication of babies during their first six months of life concluded that a pattern of development in social behaviour was forming in all five infants in the study. While interesting and affirming of practices based on belief and observation, the results of the studies of neuroscience may be of limited use to early childhood educators. Hannon (2003) argues that such studies are unlikely to change current practice and Wilson (2002) also suggests that brain science has little to offer parents who struggle in circumstances of poverty and other social difficulty.

Gopnik et al. (1999) suggest that despite extensive studies, it is at times difficult to grasp the amazing phenomenon of how young children think. They summarise this notion in terms of three elements: *Foundation* where babies are able to translate information and interpret their experiences in particular ways predicting new events; *Learning* when babies use their experiences to modify and reshape their initial representation thus achieving more complex and abstract representations; and *Other People* who care for the children actively yet, unconsciously promote, encourage and influence children's representations.

In his work, Brierley identified 21 principles for teaching and learning based upon knowledge of brain development. He made it clear that the more children learn, the more their brains have the capacity to learn. The following two principles help to focus on implications for young children's learning:

All forms of play appear to be essential for the intellectual, imaginative and emotional development of the child and may well be necessary steps to a further stage of development. The brain thrives on variety and stimulation. Monotony of surroundings, toys that only do one thing, a classroom display kept up for too long are soon disregarded by the brain. (Brierley, 1994, p. 111)

It was variety, stimulation and the important experiences of talking with adults which prompted the questioning and thinking from the children in the following three examples. Young thinkers construct some wonderful and apparently bizarre reasons for why things happen, drawing on their present knowledge to create explanations which are logical to them at that time (Paley, 1981). The following examples illustrate children's skills as thinkers as they struggle to explain and reason things which puzzle them about their world.

A 5-year-old boy asked his parents, 'Why are there trees?' A satisfactory answer took his parents into many reasons and a long discussion which justified the existence of trees: shady places to sit on a hot day; for making wooden furniture; equatorial rain forests; conservation; food and habitats for wildlife; and finally 'somewhere for Robin Hood to hide'. This last reason followed a visit to Sherwood Forest and the Major Oak. One part of the answer led to another question or a further reason and so dialogue between parents and child continued with an interested and lively 5-year-old applying his mind and pursuing this line of thought, continuing to think, assimilate and understand, acquiring more information along the way which extended and further stimulated his thinking. The questioning stopped when, for the moment, he was satisfied with the explanation which had been generated.

A 4-year-old girl asked her father, 'Why does the sea go in and out?' Her father gave the most reasonable explanation he could, mentioning the Moon and the spinning of the earth and the need for the sea to come into the harbours of other parts of the world. She thought that the sea came into the harbour of the small town where she lived to let the boats float so that the fisherman could go fishing, and that it went out to stop children swimming in the sea all day so that their skin did not get wrinkled! She thought that this going in and coming out of the sea was all 'a waste of time' and that the sea should stay in the harbour all the time so that the boats could always float, people could go fishing whenever they wished and the children could swim whenever they wanted to. Her search for reason and justification led her to create an explanation and some logical reasoning from what she presently knew and how she wanted things to be.

A 4-year-old girl was in the car with her mother when she asked 'Mumma? Why are we here?' Thinking that her daughter was asking why there were where they were on their journey she said – because we are on the way to the shops. 'No' replied the little girl 'Why are we here ... why are we people, here, in this world?' Her mother was quiet, thinking of how to respond. 'I know', said the 4-year-old. 'I think God put us here. The world was sad with no people to enjoy it so he made us and put us here because it's a nice place.' Her mother, being able to come up with no better reason at the time, agreed that yes, quite possibly, that was why they were there! Perhaps this question was just too big for either of them to find another answer at that point in time.

Piaget's insights into children's thought and language contribute to our understanding of young children's minds. Piaget (1953) gave some fascinating lists of 'why' questions which were asked by children, providing illustration of children's thinking and their search for reason. The children about whom Piaget wrote asked questions of causality and questions of justification. Those who spend time with young children will find a familiar tone in questions like 'Why does the sea go in and out?' and 'Why are there trees?' and 'Why are we here?' Young children ask questions which Piaget would categorise as the 'whys of

logical justification' when they look for logical and sensible reasons for the things they see and are told, and sometimes, it seems, God is the only answer to these unfathomable questions! While Piaget thought young children 'egocentric', this term need not be considered in a selfish sense, nor should children's egocentricity be thought of as a deficit (Piaget, 1972). Nathan Isaacs, an ardent admirer and follower of Piaget, put forward his own thesis on children's 'why' questions in an appendix to Susan Isaacs' book (Isaacs, 1930). He wrote:

The topic of children's 'why' questions is, I believe, worth special attention in connection with the general issue of the relation of child thought to adult thought. Contrary to such views as Piaget's, these questions seem to me to bear witness to the essential identity of structure and function of thought throughout our life history ...

The child's 'why's' – or rather, one important and common class of them – appear to me to show him actively interested in his knowledge as such and directly concerned with the question whether it is (*a*) correct, (*b*) sufficient, and (*c*) clear and unambiguous. (p. 293)

Young children work hard to make sense of the things they encounter and use all that they know to try to understand. To reply to a child's why question with an answer such as 'because it is' or even 'because I say so!' or even 'because God did it', will not suffice because such responses will not satisfy children at their stage of thinking and do not do justice to children's capacity to think through what they encounter as they try to make sense of what they find.

Children's questions, puzzles, problems, solutions and fascinations have formed the substance of this chapter, demonstrating the active and creative ways in which children learn, how they think about the world and make sense of their experiences of it. The view of children as capable and serious learners and thinkers is a recurring theme throughout this book.

Questions and activities

Consider your provision for open-ended and exploratory play. Does it offer rich and uninterrupted opportunities – indoors and out – for children to play and discover with each other and with adults?

Consider Gopnick et al.'s (1999) three elements of thinking: foundation, learning and other people. Is this a useful framework for thinking about how the children in your setting go about their learning?

Make a point of noting down the 'why' questions that children ask. Consider if your ways of responding are always appropriate.

Further reading

- Athey, C. (2007) *Extending Thought in Young Children: A Parent–Teacher Partnership* (2nd edn). London: Sage.
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