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Understanding Schema in Children's Learning

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Early Years Team

Spring 2010

Background to the Concept of Schema

Human behaviour is an interesting area of study for many – nowhere more so than when focused in the very young within our species. The concept of schema as a way of enhancing our understanding of children's play, activity and behaviour, is rooted in many generic theories of learning and development.

The frequently observed habitual play of young children captures the essence of what is meant by schema theory. It is in the preferred rituals and repetitions of favourite movements, activities, language and mark making that we begin to recognise what may be schematic learning.

There are many definitions of schemas in relation to children's learning:

" Schemas are 'patterns' of actions that they demonstrate when they are exploring the world and trying to find out how things work. Children may try out the same action on a variety of different objects." (Whalley, 2007)

"A schema is a pattern of repeated actions. Clusters of schemas develop into later concepts." (**Athey**, 2001)

"Schemas are patterns of linked behaviours which the child can generalise and use in a whole variety of different situations. It is best to think of schemas as being a cluster of pieces which fit together." (**Bruce**, 1997)

Children may display one very dominant schema, or may work comfortably evidencing a 'cluster' of several schemas.

Bruce (1997) stated that particular schemas 'network' or 'link together in clusters' at times to enable co-ordination and development into more complex forms of learning. Many schemas have been identified in recent years – forty-one were identified by **Cath Arnold** (1997)!

It is worth noting that the above definitions are quite recent – this is a modern concept, although based on many well-established understandings of children's learning.

Current understanding of child development has been strongly influenced by the constructivist stance of **Jean Piaget** (1896 to 1980), the Swiss psychologist whose theories of cognitive development have enhanced our appreciation of children's learning as a process of active construction of knowledge. Piaget perceived the child as an 'architect of his own understanding', implying a reactive role for teachers and adults in the learning process. He described learning as being dependent on the assimilation of the child's **emerging mental schemas,** with progress occurring through the maturation of the nervous system and also through experiences children gain by actively experimenting with their own environment.

Lev Vygotsky (1896 to 1934), the Russian psychologist who has been another significant influence in our understanding of human development, did not refer specifically to the term 'schema' in his work. However, his articulation of learning being fundamentally a social process, in which infants develop an awareness of a sense of self and a capacity for thought through interaction with others in their environment contributes much to our understanding of children's development through play and language. Bruce (1999) and Meade (1999) both highlight the role of more mature 'others' in influencing children's development in their response to schema-related play.

The educational philosophy of **Maria Montessori** (1870 – 1952) the Italian physician and educator has also influenced pedagogical thought in many ways. She was a great protagonist of observing children as natural learners within their environment as the basis for supporting their on-going development. It is imperative to observe children's play in order to identify possible schematic behaviour and then to plan for their future development based on this knowledge. Montessori also introduced the idea of 'the absorbent mind', the limitless motivation of the infant to become competent and skilful within their environment, a phenomenon which was characterized in her view by the young child's capacity for repetition of activities.

More recently, Dr **Colwyn Trevarthen**, originally from New Zealand but currently working in the University of Edinburgh, has been studying the infant mind since the mid-sixties. He has sought to explore the dynamic patterns which underlie all kinds of communication, including language and music. He has concluded that the rhythms and emotions of children's play often support their cultural learning. Again, it may be that this concept of 'communicative musicality' – founded on rhythm and pattern in language and behaviour can support our understanding of schema theory.

There has been increased interest in educational circles in recent years in the concept of learning styles/preferences and **Howard Gardner**'s theory of 'multiple intelligences'. These theories may also help explain why some children choose to engage in certain tasks/activities/behaviours in a repetitive way. It may be that their choice reflects their preferred or dominant learning style or the particular intelligence which is their strength.

It is also worth noting that it has been established that where children's patterns of learning or schema are identified and supported by adults in their setting, it can lead to higher levels of self-esteem (**Roberts**, 2002). The concepts of *well-being* and *involvement* were identified by Professor **Ferre Laevers** (1994) of the University of Leuven, Belgium, as the key processes within the child which influence their all-round effectiveness as learners. Anecdotal evidence from participating schools in this project would support Roberts' findings that when engaged in play within a dominant schema, children most often display high levels of well-being and involvement.

In more recent decades, educationalists have been strongly influenced by the findings of neuroscience. Through advances in technology, particularly with the development of MRI and CAT scans, we now know much more about the process of learning as it happens physiologically within the brain that has ever been known before. The appreciation of how brain cells or neurons communicate with each other and develop pathways through making synaptic connections has assisted our understanding of the significance of making connections for and with children as they learn. Further understanding of how the frequency of stimulation enables more permanent neural pathways to be created may have important implications in explaining schematic behaviour in young children. The importance of repetition and rehearsal in enabling stronger synaptic connections to be established which enable a new skill or concept to be embedded in the long term memory may explain why children may choose or need to engage in repetitive play activities.

Significant questions in relation to this issue have been asked by Dr **Anne Meade** (1999) in relation to a New Zealand schema learning project in which they discovered that aspects of children's attainment increased when adults responded to schema-related activities observed in children's play by providing enriched opportunities related to the schema. She hypothesised, for example, that when enriching experiences are provided for children facilitating increased repetition of behaviour that it may be associated with the strengthening of synapses. Further research into the potential connections between schema theory and the creation of neural pathways in early human development will be an area of great interest for many.