Infancy and Childhood

9

CHAPTER OUTLINE

LEARNING OBJECTIVES

INTRODUCTION

INFANCY
- Physical and sensory development
- Cognitive development
- The beginnings of language and communication
- Social and emotional development

THE PRESCHOOL YEARS
- Perceptual and motor development
- Cognitive development
- Language and communication
- Social and emotional development

THE SCHOOL YEARS
- Perceptual and motor development
- Cognitive development
- Language and communication
- Social and emotional development

FINAL THOUGHTS

SUMMARY

REVISION QUESTIONS

FURTHER READING

Learning Objectives

By the end of this chapter you should appreciate that:

- there are arguments for and against stage theories of development;
- progression through the various domains occurs concurrently but at different rates;
- infants need other people for more than food and physical care;
- a toddler might use the same word to convey several different meanings;
- the child's social development and sense of gender are influenced by stereotyping and peer conflict;
- preschoolers are egocentric in that they tend to see the world only from their point of view;
- children's cognitive development can be reflected in the nature of their friendships.

INTRODUCTION

Think about tadpoles for a moment. There are clearly some important differences between tadpoles and children, but they have some interesting features in common. It is remarkable how much change a frog undergoes as it develops. Its whole physical shape is transformed dramatically from its fishlike, long-tailed infancy to pot-bellied, pop-eyed, strong-legged adulthood. It has little to say for itself initially, but as a grown-up it can croak for hours.

Although the human infant has more in common, visibly, with mature humans, it will also change in appearance substantially over the course of its lifespan. For example, the body-to-head ratio changes, the limbs elongate and strengthen, the child becomes able to stand upright and move about independently, and it continues to increase in size over a period of about two decades. The child also has a modest vocal repertoire at the start, but in due course can sing songs or discuss the sports results.

As for our mental and social capacities, a moment's reflection tells us that these change dramatically, too. The emergence of language during childhood presages a far more remarkable metamorphosis than the tadpole's emerging legs. The social life of a six-year-old is much more diverse than that of an infant. And the reasoning powers of a ten-year-old provide for intellectual activity unimaginable in a toddler.

The changes our bodies undergo are largely preordained by nature. There may be some variations as a function of nutrition, exercise or exposure to environmental hazard but, by and large, the physical progress of a young human follows a predictable course, as in tadpoles or the young of other species. Can we say the same of the human child's mental progress?

The tadpole's social future is dictated largely by nature – the need to find food, survive and reproduce. Are human lives so predictable? Clearly, some of children's major early tasks will be influenced by the surrounding culture. The language a child begins to learn reflects the language of his community. Whether a child spends her leisure time surfing the Internet or gathering

witchety grubs depends on which society she is born into. Does this mean that developing minds are shaped by the environment?

These are the kinds of questions that are investigated by developmental psychologists. As we examine specific aspects of development in infancy and childhood (this chapter) through adolescence and adulthood (chapter 10), some general themes will recur. How much is given by nature, and how much by experience? How does change come about? In particular, is change gradual or stage-like?

INFANCY

What leads to one young person growing up to beg on the streets, while his peer starts a career in the central business district?

The influential early behaviourist John B. Watson once proclaimed: 'Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select – doctor, lawyer, artist, merchant-chief, and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocation, and race of his ancestors' (1924, p. 82). But are people really empty vessels to be filled up or shaped by their environments?

People often think of infants as helpless and malleable. Clearly, in some quite fundamental respects, they are dependent upon others. They are unable to meet their own physical needs (feeding, cleansing, finding shelter) or to move around or engage in discussion. Observations such as these have led to a traditional belief that the child is shaped by experience. The strongest expressions of this assumption have been provided by behaviouristic psychologists, like Watson, who assert that the child is the product of its reinforcement history (see chapter 4).

However, more recent research by developmental psychologists has radically altered our understanding, and the traditional notion of babies as empty vessels waiting to be filled by experience has now been abandoned. In this section, we will examine an array of evidence pointing to the remarkable complexity and competencies of the normal human infant.

PHYSICAL AND SENSORY DEVELOPMENT

You and I experience the world via our senses, and our everyday negotiation of the environment depends upon our skills in exploiting and coordinating the information they provide (see chapters 7 and 8). But these abilities did not emerge suddenly. We have enjoyed the benefits of sensory equipment since we first came into the world (and maybe before).

Babies have a rich array of perceptual and physical capacities, which enable them to engage with the world in more complex ways than was once believed. Some of these capacities seem to be present at birth, some develop rapidly during the first year or so, and some vary according to the opportunities for exercising them.

Figure 9.1

Sam is one hour old. What does he make of the world? How does he deal with the information from his senses: sight, hearing, touch?

Vision

The human infant's visual system provides a crucial means of exploring and reacting to the environment (Slater & Johnson, 1998). Although newborns' visual acuity is less than perfect, they can certainly take in a great deal of visual information, and they soon show signs of pursuing it actively (von Hofsten, 2001).

If you hold an object about 30 cm from a neonate's face, he can focus on it and may track it if you move it slowly from side to side. At this stage, the baby's visual attention is likely to be concentrated on the object's edges, but over the next few weeks he will begin to explore its whole surface (Aslin, 1987). Within the first couple of months, infants can switch visual attention from objects immediately in front of them to events (such as a light flashing) on the periphery of their visual field (Maurer & Lewis, 1998). By three or four months, they are able to organize complex visual configurations, distinguishing

Research close-up 1

How developmental psychologists study newborns

The research issue

Rigorous psychological research calls for careful control of test procedures. This is difficult enough to arrange even with adult participants, but how can we get infants to participate usefully in an experiment? Infancy researchers exploit many ingenious techniques, such as monitoring babies' visual attention, heartbeats or sucking rates in response to changes in their sensory environments. In a good example of such work, Laplante, Orr, Vorkapich, and Neville (2000) investigated whether newborns can attend simultaneously to more than one dimension of visual stimuli. This is an important question: do babies perceive objects holistically from the outset or do they operate analytically, attending to only one component at a time?

Design and procedure

Babies just two to four days old were positioned to look into a visual chamber (see figure 9.2), where they saw an opening in which a 2 cm × 13 cm stripe appeared. The stripe was either horizontal or vertical. During each trial, the stripe moved: either right-left-right or down-up-down (each infant seeing only one direction). The researchers filmed the infant's visual attention during a series of 30-second trials.

First, the researchers established how long the baby watched the stimulus, and then kept on presenting it until the infant showed habituation (this was defined as a 40 per cent or more decrease in visual attention, as indicated by the baby's eye movements). In other words, they waited until the baby had got used to the stimulus and how it moved. Next, the orientation of the line was changed, or the direction in which it travelled was changed, or both orientation and direction were changed simultaneously. The researchers were keen to know whether the baby's amount of looking changed, as this would indicate that the child was taking note of the altered visual environment.

Results and implications

The newborns exposed to the changes showed increases in looking times, while control infants (who were exposed to no changes) did not. Furthermore, the pattern of results indicated that looking time increases were greatest in the conditions in which two changes in the stripe occurred (orientation *and* movement). These findings suggest that, from the first days of life, stimuli involving modifications on two dimensions are processed differently from stimuli containing a change in only one dimension. These very young participants could not speak – but they could tell us a lot about how they perceive the spatial world from the way in which they behaved nonverbally.

Laplante, D.P., Orr, R.R., Vorkapich, L., & Neville, K.E., 2000, 'Multiple dimension processing by newborns', *International Journal of Behavioral Development*, 24, 231–40.

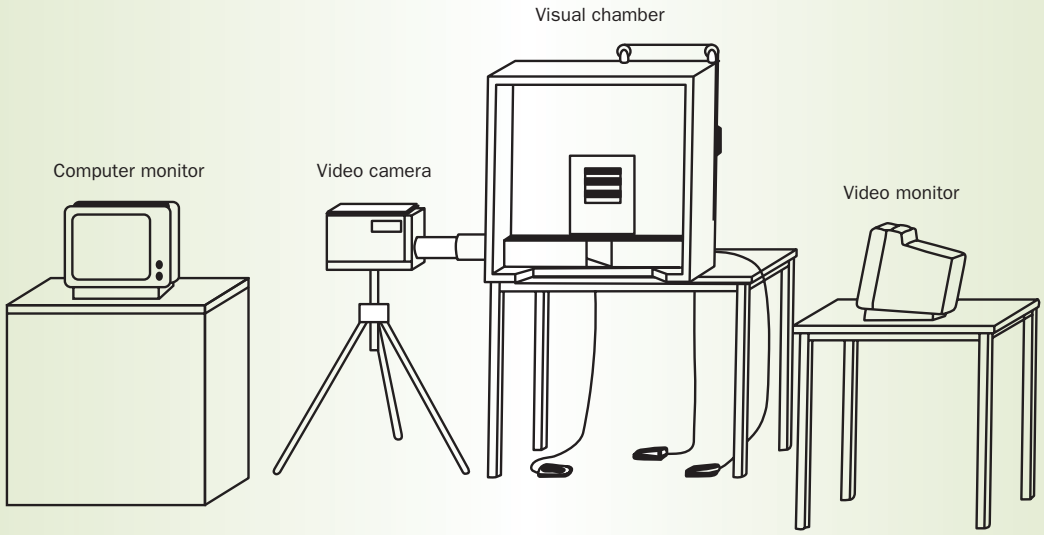

Figure 9.2

Visual chamber and equipment used to assess newborns' looking behaviour. Source: Laplante et al. (2000).

between intersecting forms (Quinn, Brown & Streppa, 1998) and exploiting illusory contours to perceive boundaries and depth (Johnson & Aslin, 1998).

Babies appear to be particularly interested in faces, which hold their attention and elicit smiles (Fantz, 1961). Some evidence indicates that even neonates less than one hour old prefer illustrations of a human face to other patterns of similar complexity, and they prefer regularly organized representations to pictures that jumble the facial features (Johnson & Morton, 1991). Such early preferences raise the serious (if controversial) possibility that infants have innate 'face detectors', which direct their attention to this aspect of the visual environment (Slater et al., 2000).

Hearing, taste and smell

The infant exploits all her senses as she learns about and reacts to her world. Hearing, although not fully developed at birth, is well developed at this stage, enabling young infants to discriminate among sounds that vary in volume, duration and repetitiveness, and to organize their perception of and responses to the spatial environment (Kellman & Arterberry, 1998). So when exposed to the 'approach' of an illusory object (a sound increasing in volume), quite young infants lean away as the noise gets louder (Freiberg, Tually & Crassini, 2001).

Perhaps one of the starkest pieces of evidence against the 'empty vessel' theory of human nature comes from the infant's discrimination among tastes (Mennella & Beauchamp, 1997). Babies are not passive when it comes to food and drink, and display clear preferences. Their sucking rate increases for sweet liquids, but decreases for salty or bitter liquids (Crook, 1978). They show by their facial or vocal expressions whether they like or dislike a particular taste, and will protest vigorously if offered something they find unpalatable (Blass, 1997).

These preferences are by no means arbitrary and may well have survival value. Infants do not have conscious nutritional information to help them decide whether a foodstuff is good or bad for them, but they know what they like. For example, alcohol is potentially harmful to infants, and research suggests that they would prefer not to drink it. Mennella and Beauchamp (1994) compared babies' consumption of breastmilk when their mothers had been drinking either alcoholic beer or non-alcoholic beer. In the alcohol condition, the babies drank significantly less milk. Babies' taste preferences can also be exploited by adults – certain tastes, such as milk or sweetened drinks, help to calm down a crying infant (Blass, 1997).

Infants react to smells in similar ways. Their facial expressions or head orientations reveal whether they find a smell pleasant or unpleasant (Soussignan, 1997). Again, the sensory preferences may have survival value. For instance, there is evidence that infants are attracted to the smell of amniotic fluid and to milk (Marlier, Schaal & Soussignan, 1998).

Motor development

The neonate has several reflexes (automatic physical responses to external stimulation), including:

- the rooting reflex – a tendency to orient the head and mouth towards an object touching the face;
- the sucking reflex – a tendency to suck on objects placed in the mouth;
- the grasping reflex – a response to stimuli (such as a finger) placed in the open palm;
- the Moro reflex – a reaction to sudden loss of support to the neck and head in which the baby thrusts out his arms and legs as if striving for support; and
- the stepping reflex – the infant attempts to take 'steps' if held upright with feet touching a surface.

Some of these reflexes have important benefits. For example, the rooting and sucking reflexes ensure that the normal infant will respond to contact with the mother's breast by seeking out the nipple and feeding (Widstrom & Thingstrom, 1993).

Although biology provides the reflexes, early experience is important insofar as it can affect their manifestation. In one study, neonates who were separated from the mother during the first hour after birth were less likely to demonstrate correct sucking techniques, and babies whose mothers were sedated during the birth did not suck at all during the first two hours (Righard & Alade, 1990).

COGNITIVE DEVELOPMENT

'Cognition' is a broad term encompassing reasoning abilities, knowledge and memory (see chapters 11, 12 and 17). The study of cognitive processes is fundamental to many topics in psychology. Developmental psychologists are interested in the origins and course of cognitive capacities, with a great deal of interest therefore being paid to their manifestation in infancy.

Infants react to information provided by their senses by attempting to organize experience, make sense of phenomena, and anticipate events or outcomes. In fact, when we examine what infants do with the data they obtain from the world, we find that they appear to behave in much the same way as scientists. They try things out, they collect more evidence (by exploring and by trial and error), and they start to develop theories.

The idea that babies, without the benefit of a formal education and not even able to speak, could generate theories about the world seems surprising on first consideration. Yet, one of the most influential psychologists of the last century has argued exactly this, and his account has attracted enormous interest from other psychologists and educators.

The sensorimotor stage of development

Jean Piaget (1896–1980), a Swiss psychologist, developed a model of cognitive development which holds that children's thinking progresses through a series of orderly stages. According to Piaget, each stage reflects qualitative differences in the way the child understands and acts upon the world relative to its status at another developmental phase.

Later in this chapter, and in the next, we will consider the other stages of Piagetian development, but for the moment we will

sensorimotor stage the first stage of cognitive development, according to Piaget, extending from birth to approximately two years, when the child constructs an elementary understanding of the world and thought is tied closely to physical or sensory activity

focus on the first, *sensorimotor stage*, which Piaget described as extending from birth to approximately two years.

Piaget saw the child in this stage as acting to learn about itself and its relations to the environment. A key emphasis here is on the child's actions. Piaget believed that children learn by doing, and that they advance their understanding by testing what they know to its limits (much as scientists do).

Piaget argued that initially infants lack the ability to reflect consciously on their experiences, but they do have a set of reflexive capacities (including those that we considered earlier in this chapter) that cause them to react to environmental stimuli. These are simple, but important processes. If something is placed near an infant's mouth, she will attempt to suck it. If you place your finger in a baby's hand, she will grasp it. The baby can also make vocal sounds. All of these actions can be repeated, and babies do indeed repeat them, generally becoming more proficient with practice.

The actions can also be modified to cope with new experiences. As well as grasping your finger, infants will respond similarly if you place a rattle or toy in their hand, or if they find a bar on the side of their crib. In this way, the infant develops action-based schemes – organized patterns of behaviour that she comes to rely on in dealing with her world.

Before long, the infant discovers interesting new consequences from her initially reflexive schemes. Grasping some objects (toys) causes the infant to produce interesting noises (squeaks or music). Sometimes a shake (of a rattle) or a push (of a mobile) yields other appealing sounds or movements. The infant repeats the action, and the same thing happens. In these ways, babies are learning about cause–effect relations, and their own ability to influence the world. Infants show delight as they learn how to control things, and repeat the actions frequently – until it becomes too easy, and then they seek new challenges.

Pioneer

Jean Piaget (1896–1980) was one of the most influential psychologists of the twentieth century. Born in Neuchâtel, Switzerland, in 1896, he published his first paper (a short note on an albino sparrow) at the age of 11. He studied zoology at the University of Neuchâtel, but his interests in biological change and the origins of knowledge led him into psychology. In 1920, he moved to the Alfred Binet laboratory in Paris, where he undertook research on intelligence testing, leading to a fascination with the reasons that children suggested for their answers to standard test items. This resulted in some 60 years' ingenious research into the development of children's thinking. In 1955, Piaget established the International Centre for Genetic Epistemology in Geneva.

Object permanence

In the course of all this seemingly playful activity, infants are learning a great deal. But at any one stage, there are limits to what they know. For example, in the first few months of life, although babies get better at manipulating objects, the stability of objects in their lives is generally beyond their control – things (such as toys) come and go. Piaget maintained that very young infants have no conception of the durability of objects: according to Piaget, at this age, while something is within reach or sight, it exists, but 'out of sight is out of mind'.

object permanence understanding that an object continues to exist even when it cannot be seen or touched

The notion that an object can continue to exist even when we cannot see it is termed *object permanence*. Piaget believed that this is a relatively late achievement of the sensorimotor period (around nine months). Other developments during this sensorimotor stage of development include greater experimentation with the things the infant can do with objects, learning to use objects as tools, and systematically copying others' behaviour to achieve new skills.

Piaget challenged

Piaget's descriptions and explanations of infant activities are persuasive and continue to have a great deal of influence upon developmental psychology. But they have been challenged. Subsequent research has demonstrated that Piaget tended to underestimate infants' abilities. For example, several studies have shown that object permanence is available earlier than Piaget believed to be the case. Hood and Willatts (1986) presented five-month-olds with objects within their reaching distance. The researchers turned off the lights, removed the objects and released the babies' arms. The infants tended to reach towards the place where the object had been located before the lights went out, indicating that the infants could maintain a representation not only of the object but also of its location.

Some of the perceptual abilities that have been described in infants (e.g. face perception, discrimination among speech sounds) also present a problem for Piaget's theory. One of his core assumptions was that children have only a limited amount of innate knowledge and that they construct their understanding of the world through active and general developmental processes.

By 'general', Piaget has in mind that changes are proceeding at roughly the same pace in most areas of the child's knowledge. There is a broad sweep improvement going on in mental capacities that is reflected in different areas of understanding roughly simultaneously. This seems to make sense: after all, we know that babies can do a lot more at 15 months than they can at five months.

But if some abilities are 'built in', then considerably more is innate than Piaget maintains. As well as face perception and speech discrimination, there is also intriguing evidence that infants as young as five months can add and subtract with small numbers, leading to speculation that humans are born with the capacity to

perform simple arithmetical operations (Wynn, 1992). There is little basis for explaining the development of these abilities by the outcome of general changes resulting from continuous activity.

Furthermore, whether these abilities are innate or not, they seem to develop at different times. Some emerge quite early, such as face perception, which is well developed (though not complete) in the preschooler. Others take a bit longer, such as language, which starts during the first year but progresses into middle childhood. Arithmetic ability is still developing into the teens.

Maybe, then, Piaget is mistaken to conceive of development as one all-embracing general process, with changes occurring at about the same time across all areas of knowledge. On the basis of observations like these, some psychologists believe that it may be better to regard the growth of knowledge as involving specific domains, each with its own developmental course (Keil, 1999).

This debate – between those who (like Piaget) favour domain-general theories and those who favour domain-specific theories – highlights fundamental questions about the nature of the human mind and is central to much of contemporary developmental psychology (see Garton, 2004; Hatano & Inagaki, 2000).

constructivist theorist who attributes the acquisition of knowledge to the active processes of the learner, building on increasingly complex representations of reality

Piaget made a key contribution to psychology by highlighting the importance of the infant's actions as a source of development. Piaget was a *constructivist*: he saw development as a kind of self-directed building process, in which the individual constructs schemes of action, applies them repeatedly until reaching their limits, and then improves upon them in the light of new discoveries. Although details of his theory have been challenged, in the light of Piaget's contributions most researchers agree that infants are active cognitive beings, not the blank slates supposed by the early behaviourists.

The beginnings of language and communication

The word 'infant' means literally 'without speech'. Babies cannot join us in verbal conversation, cannot answer our queries, and cannot articulate all of their needs and interests. Yet they can certainly communicate.

Communication between the infant and others does not await the emergence of language but proceeds throughout the first year. Very young infants tell us about their feelings and needs by crying and smiling. They show responsiveness to voices, orienting their attention to speakers, and even their larger body movements indicate sensitivity to the rhythm of speech. Caregivers are usually very responsive to the infant's sounds, treating vocalizations – even the humble burp – as though they were contributions to a conversation (Kaye, 1982). Initially, caregivers have to do much of the work to sustain the to-and-fro of the interchange, but gradually the infant comes to take an increasingly active role (Rutter & Durkin, 1987; Schaffer, 1996).

Infants' ability to discriminate among speech sounds appears to be quite general at first. In their first few months, they can discriminate among sounds that are critical in the language of their own community but, interestingly, they can also distinguish sounds in foreign languages that are not used in their own (Hernandez, Aldridge & Bower, 2000; Werker & Tees, 1999). But this capacity does not last, which is why you (depending on your linguistic background) may now experience difficulties with some of the sounds of, say, Cantonese or Estonian. Sometime during the second half of your first year of life, you probably began to lose your sensitivity to phonetic contrasts in languages other than the one(s) you were learning. Polka and Werker (1994) found that while four-month-old American infants could discriminate vowel contrasts in German, six-month-old Americans could not.

In due course, the child becomes able to understand some of the things that are addressed to him. Labels for key objects or events (e.g. 'biscuit', 'bedtime') are repeated frequently in meaningful contexts, and many parents try to coax words out of the infant (e.g. 'Da-da. Say "da-da"').

Around the end of the first year, normally developing children typically have a few words available (Barrett, 1995; Barrett, Harris & Chasin, 1991). At this stage, these words may not always conform perfectly to the structure of the adult language (e.g. 'da' for 'daddy', 'mi' for 'give me'), but they are typically used appropriately, and people familiar with the child usually know what is meant. At this stage, the child's utterances typically consist of just single words, but, by changes in intonation, and coupled with gesture, these can be used to express a variety of meaningful relations, including possession, location, negation and interrogation. For example, 'da', in different situations, could mean 'It's daddy's', 'Daddy has it', 'Not daddy', or 'Did daddy do it?'

Exactly how the child begins to master language presents many mysteries, but two things are clear: the process begins well before overt speech appears, and it occurs in a social context.

Social and emotional development

Human beings are social creatures (see chapters 17 and 18). Connecting to the social world is all the more crucial for the infant, because without the attention and care of others, she would not survive. Fortunately, others (particularly parents) tend to be strongly motivated to involve children in the social world, and to attend to their needs. Just as importantly, the infant is well equipped to participate in the social world from the beginnings of life.

Perceptual abilities are closely implicated in the infant's early social experiences. For example, we noted earlier that infants reveal a very early interest in the human face. This is an interesting perceptual preference, but it is still more important as a social characteristic. After all, faces are one of the best means of differentiating between people, and a valuable source of information about how others are reacting to us or the environment. There is evidence that infants can gather information about faces remarkably swiftly. Researchers using visual preference techniques or measurements of sucking rates have shown that newborns only days or even hours old prefer their mother's face to that of a female stranger (Bushnell, Sai & Mullin, 1989; Walton, Bower & Bower, 1992). The other senses are exploited

Figure 9.3

Babies as young as one or two weeks can recognize the smell of their own mother's breasts.

similarly. For example, infants as young as one or two weeks of age can discriminate the smell of their own mother's breasts from those of other breastfeeding women (Porter et al., 1992).

Fear of strangers

Anyone with an interest in babies and a little patience could provide much of the stimulation (coos, cuddles, facial displays, gentle handling) that infants enjoy, and babies will generally respond to opportunities for interaction with others. However, quite early in life, infants begin to show one of the distinguishing features of human social behaviour – selectivity (Schaffer, 1996). During the first few months, much of the infant's early social experience takes place in the microcosm of the family, and the most intensive interactions will usually be with the primary caregiver(s). But other people appear from time to time (healthcare professionals, visitors, neighbours) and the infant's social world gradually broadens. However, before long, it becomes very clear that the infant prefers the company of particular individuals – not surprisingly, but importantly, the primary caregivers.

Schaffer and Emerson (1964) followed a sample of Scottish infants during the first year, observing them in various social situations at home with their primary caregivers (mother, father, grandparents, etc.) and with female strangers. By monitoring the babies' nonverbal reactions, they found a gradual increase in preference for specific individuals from around the age of five months. It appears from research such as this that, by at least the middle of the first year, the child has formed an attachment (or attachments) to a specific person (or persons). At around the same time, the child begins to show a quite different reaction – anxiety – when approached by unfamiliar people.

At this point, spare another thought for the tadpole. One of the gravest problems about being a tadpole is that fish consider them a gourmet delight. As a result, tadpole survival rates are poor. But evolution has given tadpoles a chance of escaping the unwelcome attentions of passing fish. Tadpoles respond to chemical and tactile cues from predators, and swim fast to get as far away from them as they can (Stauffer & Semlitsch, 1993). This response appears to be built in, as it has been observed in laboratory-reared tadpoles, which have had no opportunities to learn about escape tactics.

What does this have to do with the human infant? At around five to eight months, human infants begin to display a form of behaviour that has much in common with that of the cue-sensitive tadpole: they start to show wariness of strangers and strive to maximize their distance from them.

Human infants also seem to be sensitive to a number of cues emitted by the stranger. All of their perceptual capacities seem to

Figure 9.4

This child was playing happily until a stranger appeared.

help them to determine that 'this person is not mum or dad'. But, unlike the tadpole, the human infant's reaction also entails a cognitive component. The child tends to cease other activity and monitors the stranger carefully. If the stranger attempts direct interaction (e.g. by picking the child up), there may be resistance, protest and distress on the part of the infant. When this happens, the infant can usually be calmed only by being returned to the caregiver.

Forming a relationship model

The development of the two aspects of social selectivity – attachment and wariness of strangers – are closely related in onset and developmental significance (Schaffer, 1996; Schaffer & Emerson, 1964; see also chapters 1 and 6). Many social developmentalists believe that the formation of attachments is a vital aspect of early relations. Through attachment, the infant maximizes opportunities for nurturing and protection, establishing a secure base from which to explore the rest of the world (Bowlby, 1988).

According to Bowlby (a British psychiatrist who developed an influential theory of attachment and its consequences), through the course of the first attachment (i.e. to the principal caregiver) the infant also begins to formulate an *internal working model* of what a relationship involves. If this is correct, early attachment could be the most important relationship that the child ever forms. In fact, a great many studies by attachment researchers indicate that the type of attachment formed during this first relationship has long-term implications.

internal working model a set of basic assumptions (a schema) about the nature of relationships

Mary Ainsworth, an American colleague of Bowlby's, proposed that there are three main types of attachment relationship formed by infants and their caregivers (Ainsworth et al., 1971). She tested her typology by observing infants' reactions to a laboratory test – the 'strange situation'. The baby is initially playing with his mother and is then approached by a stranger. After a while the mother leaves, and later she returns. This departure–return sequence may be repeated.

Based on a careful coding system for scoring details of the child's responses throughout the session, Ainsworth identified the following three types of relationship:

Type A Insecurely attached/avoidant. This infant is relatively indifferent to the mother's presence, does not seem greatly disturbed by her departure, and does not show enthusiasm for contact on her return.

Type B Securely attached. The infant plays happily in the new environment, shows some distress when the mother departs (especially for a second time), but responds positively to her return.

Type C Insecurely attached/resistant. The infant tends to explore less, is greatly distressed by the mother's departure, is difficult to console upon her return, and may struggle to be released from her embrace.

Pioneer

Mary D. Salter Ainsworth (1913–99) was one of the leading scientists in the study of human attachment. Born in Ohio, she grew up in Toronto, Canada, where she studied, and then taught, psychology. In 1950, she joined John Bowlby at the Tavistock Clinic in London, initiating a lifelong interest in the relationship between child and caregiver. She moved in 1954 to the East African Institute for Social Research, Uganda, where she conducted a longitudinal study of mother–infant attachment. In 1962, she began the Baltimore longitudinal study, which proved a seminal investigation and introduced new techniques for classifying attachment types.

Much subsequent research has supported this classification, which has been used in studies of early child development around the world (Van Ijzendoorn & Sagi, 1999). Ainsworth and colleagues (1978) found that approximately 70 per cent of infants form Type B relationships, about 20 per cent fall into the category referred to as Type A, and around 10 per cent of infants form Type C relationships.

If it is true that the primary attachment is the base from which the infant begins to tackle the rest of life's challenges, then you can see at once that the Type B child appears to have an advantage. Feeling secure and supported, she is ready to explore and learn. If problems occur, the caregiver is there, but the child feels confident to try things out. Furthermore, because the basic relationship is a positive and enjoyable one, the child should expect (i.e. have an internal working model) that other relationships will be enjoyable, and hence respond favourably to opportunities to interact with other people. Many studies show that Type B infants tend to demonstrate higher levels of cognitive and social skills during their preschool or later years (Meins et al., 1998; Suess, Grossman & Sroufe, 1992; Youngblade & Belsky, 1992). The topic is controversial (see Schaffer, 1996), but it does appear that the quality of the infant's initial relationship can help predict aspects of subsequent development.

THE PRESCHOOL YEARS

During infancy, children develop considerably and learn a great deal about themselves and the world. In some respects, the child has already undergone major transformation, from the relatively dependent neonate to an individual capable of expressing and meeting many of her own needs. Nevertheless, there is much development ahead. In this section, we consider some of the developments of the preschool years, from approximately age two to five years.

Perceptual and motor development

By the end of the second year, the child's perceptual abilities have developed considerably. In many respects, they are now on a par with those of an adult. But there is still a long way to go in terms of motor skills and coordination, and substantial progress will take place over the next few years.

By the age of two, many children have begun to walk unaided and can manipulate objects independently, but their gait is unsteady and their manual dexterity is limited. Over the next couple of years, they gain competence in these respects, becoming more certain of their control over their bodies. A three-year-old is likely to be quite mobile (e.g. able to run) but may find it difficult to respond to a need to change direction or stop – leading to mishaps with inconveniently placed furniture or walls – and may have difficulties with balance (Grasso et al., 1998). A four-year-old is more agile and beginning to develop skills such as throwing and catching, jumping and hopping. And a five-year-old is quite competent in basic movements.

Motor development during these years reflects an interaction between biological maturation, experience and cognition (Thelen, 2000).

Cognitive development

When we left the infant towards the end of the sensorimotor period, he had attained object permanence, was increasingly able to manipulate objects as playthings and tools, and was exploiting the greater skills of others by copying behaviours that appeared successful.

These kinds of developments enable the child to engage in a higher level of representation. While the early sensorimotor infant's schemes consisted of concrete actions, towards the end of this stage he becomes able to develop mental schemas.

Figure 9.5

By the age of two, many children have begun to walk unaided, but their gait is unsteady. Over the next couple of years, they become surer of their control over their bodies. By the age of four, the child is more agile and beginning to develop skills such as throwing and catching, jumping and hopping.

preoperational period the second major phase of cognitive development, according to Piaget, extending from approximately two to six years, when the child begins to represent the world symbolically but remains intuitive and egocentric

The child can now use objects to symbolize others, and is beginning to use sounds (words) for the same purpose. These skills are very useful, and the child exploits them increasingly. This leads to a new stage in development, which Piaget called the *preoperational period*.

The preoperational period

This stage of development extends from approximately two to six years, and a number of important cognitive developments are achieved during this time. Foremost is the ability to symbolize – to represent the world in images and language. This enables children to extend their understanding fundamentally. The child becomes able to represent past and future, and to think about objects or events that are not immediately present. This soon becomes evident in forms of activity like pretend play (figure 9.6). If the sensorimotor child disappoints her parents by playing more with the wrapping than the present, the preoperational child will surprise them with the news that the box is actually a helicopter and it plans to land on the building – represented by the coffee table.

Although Piaget saw the preoperational period as a time of important cognitive advances, he also emphasized the limitations of the child's thought processes at this stage. He believed that one of the most profound limitations during this phase is *egocentrism* – a tendency to see the world from our own point of view, along with an inability to take another person's perspective. Piaget found many illustrations of egocentrism in his interviews with children, in his studies of their language in preschool settings, and in his experiments.

egocentrism inability of the preoperational child to distinguish between his/her own perspective on a situation and the perspectives of others

The next time you get an opportunity to listen to the language of preschool children, consider the extent to which they are conversing in the way you and I would understand a conversation, such as exchanging a series of linked remarks about the same topic. A typical preschooler in one of Piaget's major studies, Lev, engaged regularly in monologues, talking about his own activities to no one in particular:

> (Sitting down alone at a table): I want to do that drawing, there . . . I want to draw something, I do. I shall need a big piece of paper to do that.
> (After knocking over a game): There! Everything's fallen down.
> (Upon finishing his drawing): Now I want to do something else.
> **(Piaget, 1926, p. 14)**

Preschoolers like Lev accompany their actions with words in this way when alone and when in the presence of audiences. Close connections to others' utterances do not appear to be essential to the activity:

> Pie (aged 6y 5m): Where could we make another tunnel? Ah, here, Eun?
> Eun (4y 11m): Look at my pretty frock.
> **(Piaget, 1926, p. 58)**

Pie (the older child) is trying to establish coordinated efforts but Eun has her own concerns. In a major study of the language of preschoolers (1926), Piaget noted that, although the children were being studied in close proximity to their peers, more than one-third of their utterances were either not directed to anyone or were so esoteric that nobody else could understand them.

So, according to Piaget, the preoperational child tends to be dominated by his perceptual experiences and finds it difficult to imagine other aspects of an experience, such as how another person perceives things. The preschooler talks but does not always link her remarks to those of others. In an experimental task, the child centres attention on one aspect of a task, and fails to consider the relevance of other dimensions. Piagetians call this cognitive bias *centration*.

centration when a preoperational child focuses on only one aspect of a problem at a time

Probably the best known example of this is Piaget's famous *conservation* test. A preoperational child is presented with two beakers of the same shape and size. The equivalent amount of water is poured into each beaker, and the child is asked whether the amount in each is the same. Once this is agreed, a new beaker, taller and thinner than the original, is produced. The liquid from one of the original beakers is transferred to the third. The child is asked again whether the amount is the same. Preoperational children often insist that the amount has changed. They might

conservation ability to recognize that an object or amount remains the same despite superficial changes in appearance

Figure 9.6

Abel uses building blocks as traffic lights: he is clearly capable of forming mental representations of objects not immediately present, and of making one object stand in for another.

Figure 9.7

Piaget's famous conservation test is the best-known example of an experimental task in which the child centres attention on one aspect of a task and fails to consider the relevance of other dimensions. Piagetians call this cognitive bias 'centration'. Source: Slater & Bremner (2003).

see it as more than before, or less than before, but certainly not the same. Although the amount of liquid is actually unchanged, the child's perceptual experience indicates otherwise – it *looks* taller – and this tends to dominate the child's judgement. The child appears to have centred on one aspect of the transformation in the liquid (the increase in height) but has failed to take account of the other (the decrease in width).

Another example is the 'three mountains' perspective task (see Research close-up 2).

Piaget challenged

Piaget's account of the limitations on preschool children's thinking has been subject to many challenges. Some researchers have objected that the standard conservation task induces the child to give erroneous responses by asking the same question – 'Are they the same or different?' – twice. In between, the experimenter has changed the display, and, in any case, every child knows that when a grown-up asks you a question twice, it usually means you gave the wrong answer the first time. When the question is asked only once, higher proportions of preschoolers give the correct (conserving) answer (Rose & Blank, 1974).

The task demands also appear to bear heavily on children's performance. Borke (1975) provided three- and four-year-olds with a perspective task, which involved viewing a set of familiar objects on a turntable. The task was to rotate the set to show how the objects would look from the perspective of a *Sesame Street* character, Grover, as he drove around the display. A majority of the children performed well, and only a small proportion made egocentric errors. It seemed as if the combination of more familiar materials and a more motivating task appeared to enable these preschoolers to demonstrate competencies that Piaget believed are attained much later in development.

Other research has also shown that preschool children are able to incorporate complex ideas into their pretend play, to follow successive actions and to make predictions about their consequences. For example, Harris, Kavanaugh, and Meredith (1994) had two- and three-year-olds watch puppets pour pretend cereal into a bowl. Children could understand this idea, and could also follow the next step, in which the puppet pretended to use the pretend cereal to feed a toy animal. They could anticipate that if a puppet poured pretend milk or powder into a bowl and then tipped the bowl over an animal, the animal would get wet or powdery. This seems simple enough to us, but it points to impressive representational abilities in the child, who creates a mental image of the cereal, milk or powder and then operates on the mental image to imagine subsequent transformations. These are cognitive skills that Piaget maintained were not available during the preoperational stage.

Piaget certainly pointed to some intriguing aspects of child thought, indicating that preschoolers may sometimes interpret the world quite differently from adults. Subsequent research indicating that he may have underestimated the competence of the preschooler (see also Bryant, 1974; Donaldson, 1978) qualifies rather than invalidates his work. After all, even if the conservation task and the 'three mountains' task do have methodological limitations, these tasks do appear to pose problems for preschoolers

Research close-up 2

Piaget's three mountains experiment

The research issue

Can young children appreciate how the world appears from someone else's perspective? Or are they bound by their own outlook (egocentrism)? One of Piaget's best known demonstrations of egocentrism comes from his 'three mountains' experiment (Piaget & Inhelder, 1956).

Design and procedure

One hundred children were tested, aged between 4 and 12 years. Each child was asked to stand in front of a model of three mountains. The mountains differed in height, colour and other characteristics. Once the child was familiar with the layout of the mountains, a doll was placed at another location (say, at the opposite side).

The children were tested in various ways. First, they were given three miniature cardboard mountains, and asked to lay them out in the way the doll saw them. The children then looked at a set of pictures taken from various positions around the mountains and had to decide which one represented what the doll would see from its current position. Finally, the children were shown a picture and asked where the doll would have to stand to get that view of the three mountains.

The doll was moved to different positions and the children tested again. The children were also moved to different positions and asked to select the picture that represented their new perspective.

Results and implications

Children aged around four years find this task very difficult and do not appear to understand the instructions.

Children below about age seven seem to fail to discriminate between their own perspective and that of the doll: instead, almost invariably, they pick the picture that represents their own point of view. For example, one six-year-old boy selected his own point of view, even though the doll was to his right, and announced: 'It's this one because the green [mountain] is here [points to his right] and so is the little man [also on his right]' (Piaget & Inhelder, 1956, p. 219).

At around eight years, children show awareness that people in different locations have different perspectives on the mountains, but they are not very consistent in working out exactly how things look from positions other than their own. For example, in the situation described above, they might realize that an object to their own right would be to the left of the doll, or that an object that is in front from their perspective is behind from another's perspective, but they find it difficult to process these cues simultaneously.

You might be thinking this would be hard for an adult too. It is certainly a challenging task, but by around ages eight and a half to nine, Piaget and Inhelder found that most children were able to handle it successfully. They concluded that the transition from egocentric thinking to being able to coordinate relations in space is a lengthy process, developing over several years in middle childhood.

Piaget, J., & Inhelder, B., 1956, *The Child's Conception of Space*, London: Routledge & Kegan Paul.

Figure 9.8

The three mountains task. The child walks around the display and is then asked to choose from photographs to show what the scene would look like from different perspectives.

Pioneer

Paul L. Harris (1946–) is currently based at the Harvard Graduate School of Education. Harris is interested in the early development of cognition, emotion and imagination. His recent book, *The Work of the Imagination*, gathers together several years of research carried out at Oxford University, where he taught developmental psychology. Currently, he is studying how far children rely on their own first-hand experience or alternatively on what people tell them – especially when they confront a new domain of knowledge.

Pioneer

Margaret Donaldson (1926–), author of the highly influential book *Children's Minds*, worked as a child development psychologist at Edinburgh University. Donaldson challenged Piaget's method of studying egocentricity in children, after producing different results when she applied a social dimension to Piagetian tasks given to preschoolers. Donaldson argued that the preschoolers' inability to perform Piaget's tasks was due to their difficulties with understanding (or abstracting) the questions, and not to their egocentricity or lack of logical skills.

but not for older children. If you can, try the tasks out yourself with a few children aged three to eight. Invite the children to explain their responses, and judge for yourself whether Piaget has provided us with fascinating (or misleading) insights into developmental changes in children's thinking.

Theory of mind

Another important aspect of early cognitive development is a capacity that we take for granted. And yet it is a distinctive human ability whose origins and developmental course prove difficult to uncover. This is the phenomenon of theory of mind.

Theory of mind refers to the understanding that people (oneself and others) have mental states (thoughts, beliefs, feelings, desires) and that these mental states influence our behaviour. It seems pretty obvious to you and me that we have minds. But how do we know? We can never see or touch a mind; we cannot directly observe mental processes in action. The 'mind' is quite an abstract concept. Indeed, perhaps you are studying psychology because you would like to find out more about this intriguing but elusive possession.

Preschoolers cannot read psychology textbooks. So how do they find out about minds? Do young children appreciate that they and other people are thinking beings? Do they understand that what a person thinks or believes can affect what she does?

Imagine this scenario, put to young children by the developmental psychologists Wimmer and Perner (1983):

> Maxi has a bar of chocolate, which he puts in the green cupboard. He goes out to play, and while he is out his mother moves the chocolate to the blue cupboard. Then Maxi comes in, and he wants to eat some chocolate. Where will he look for the chocolate?

Would you expect Maxi to look in the green cupboard, where he last saw his chocolate and where he believes it still to be? Or would he look in the blue cupboard, where *you* know the chocolate is now? If you have a theory of mind – so you understand that people act according to what they believe to be the case – then you will answer that Maxi will look in the green cupboard.

Interestingly, Wimmer and Perner found that children under the age of about five or six often answer, with great confidence, that Maxi will look in the blue cupboard. So preschoolers seem to be dominated by their own knowledge and find it difficult to grasp that Maxi would be guided by his own false belief. Slightly older children are more likely to take account of Maxi's mental state. They know that he is wrong, but they can understand that, on the evidence available to him, he is likely to think that his chocolate should be where he stashed it. The researchers also checked whether the preschool participants could remember where this was: they could, yet they still insisted that Maxi would look in the new location.

This experiment led to a great deal of discussion about young children's grasp of mental processes. It seemed to indicate that preschoolers have serious difficulties understanding that people's behaviour is an outcome of their mental states (in this case, their beliefs). Because the difficulty could not be explained merely as a problem with memory, Wimmer and Perner suggested that some special cognitive skill must be emerging around the period between four and six years of age: the child is developing a theory of mind.

This topic excited a great deal of subsequent research. Other investigators showed that, if the task is simplified a little, four-year-olds demonstrated understanding of false belief (Baron-Cohen, Leslie & Frith, 1985). In non-experimental settings (such as everyday conversations), others found that even younger children do make spontaneous and contextually appropriate references to mental states, which suggests that they do have some early awareness of the relevance of mind to human behaviour (Flavell, 2000). For example, Dunn (1999) reports that a three-year-old participant turned to her four-month-old sibling and said: 'You don't remember Judy. I do!' This brief remark indicates not only that the child had some understanding of the phenomenon of memory but also that she could simultaneously (and accurately) appraise the relevant contents of her own mind and that of her baby sister.

The emergence of theory of mind raises some fascinating questions and has provoked a lot of ingenious research (see Smith, Cowie & Blades, 2003). For our purposes, it is enough to state that important developments in children's understanding of mental states seem to occur at around age three to four years. Given the complexity of the concept of mind, this is remarkably early. Yet, given the centrality of mind to our everyday interactions with

other people, it is clearly an essential capacity, and it would be hard to imagine life without it.

In fact, there are people who do have particular difficulty with theory of mind tasks – children with *autism* (Baron-Cohen et al., 1985). Interestingly, one of the defining characteristics of people with autism is that they have severe difficulties communicating and interacting with other people. Could this be because they lack a theory of mind? The nature of children's theory of mind, and its implications for other aspects of their reasoning and social behaviour, are central topics in contemporary developmental psychology.

autism early onset, biologically caused disorder of communication and social interaction, usually accompanied by obsessive and stereotyped behaviour and intellectual disability

Language and communication

By the end of infancy, children are beginning to attempt words. They add to these first efforts slowly for a while, but then during their second year (usually between 18 and 24 months) they enter a period that some developmental psycholinguists call the *naming explosion* (Barrett, 1995). During this time, vocabulary increases rapidly, with children adding between eight and forty new words to their productive lexicon each month (Goldfield & Reznick, 1990).

naming explosion a period, usually in the second half of the second year after birth, when children's early vocabulary development accelerates rapidly

To put this in perspective, imagine you were to take a class in Gujarati or Russian, and your instructor expected to hear you using around 40 new words each month over the next year. Then remember that the infant does not have your advantage of already knowing at least one language, and of being able to use explicit tools (dictionaries, pronunciation guides, tape recordings). You would be surprised to see an 18-month-old sitting beside you in the language laboratory. Yet she is already performing much more impressive feats at home.

Putting words together

Learning a lot of words is useful, but it is only one component of language acquisition. Children also have to discover how to put words together, and this proves to be a still more remarkable process. Researchers who have compiled detailed observational records of children's early language have found that after a period of single word utterances, many children undergo a transitional period in which they begin to place separate utterances in close and meaningful juxtaposition.

Hoff (2001) describes a girl she was studying who woke up with an eye infection. The child pointed to her eye and said, 'Ow. Eye.' Hoff-Ginsberg reports that each word was spoken as if it had been said by itself, and there was a pause between them. This is not a sentence, but the meaning is conveyed as effectively as if the child had said, 'Darn it! My eye hurts.' The child has begun to exploit the potential for language to express relationships by placing words next to each other.

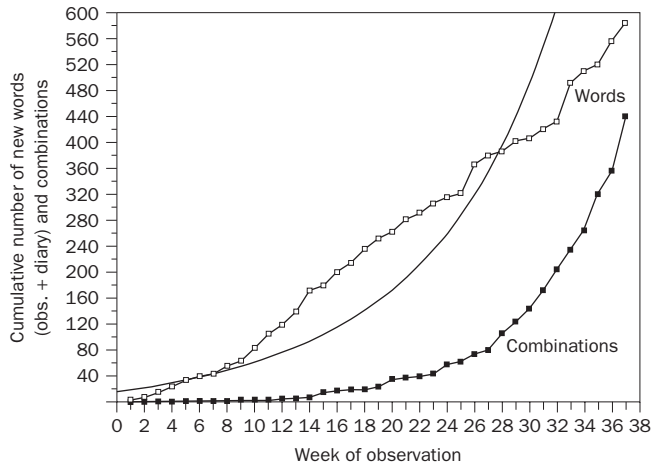

Figure 9.9

Cumulative plots, at weekly intervals, of the number of new words and new word combinations of a boy learning American English (studied from 15–24 months). An exponential function has been fitted to the lexical curve. Source: Anisfield et al. (1998).

These transitional efforts are soon replaced by frequent uses of longer word strings – usually two-word utterances at first, and then lengthier combinations (Braine, 1976; Brown, 1973). There is evidence that the increase in word combinations in turn prompts the child to learn more words – perhaps because the child is compelled to search for more specific ways of expressing more complex meanings (Anisfeld et al., 1998; see figure 9.9).

These early language structures can tell us a great deal about developmental processes. Firstly, they display regularity – children tend to use particular words in particular locations. For example, a child studied by Braine (1976) produced the following utterances (at different times):

daddy coffee
daddy shell
daddy hat
daddy chair
daddy cookie
daddy book
daddy bread

In each case, the child appeared to be expressing a possessive relationship – talking about daddy's coffee, daddy's hat, etc. Very occasionally, the child produced possessives with a different structure ('juice daddy'), but showed a clear preference for the order given above.

The child's early utterances are also revealing for what they omit. The examples above convey possessive relationships but do not include the conventional inflection ('s), and there are no articles, pronouns or verbs.

As children's utterances increase in length, there are clear consistencies in terms of what they include and omit (Brown, 1973). Children select the words with high informational content ('daddy', 'book', 'cookies'), and economize on the minor (function) words and inflections. They produce occasional over-regularizations – 'mans', 'foots', 'runned', 'shooted' – in which a regular rule (such as add –s to get the plural, or add –ed to get the past tense) is applied to an irregular word.

Three main points have emerged from research conducted in this field so far:

1. Children are selective and structured in their early attempts at language.
2. Children sometimes commit errors, but their errors suggest that they are trying to convey meanings as effectively as they can, and they are sensitive to grammatical rules.
3. Progress is quite rapid, from a handful of words at 12–15 months to large vocabularies and complex word combinations at age three or four.

Chomsky and the innate nature of language

We have only touched upon a few examples of how language is acquired, but they speak directly to the debate about the nature of child development.

Many laypeople and some psychologists have assumed that language is learned by observation, imitation and reinforcement (Skinner, 1957; Staats, 1968). But the examples given above pose some fundamental challenges to this account. Whom is the child imitating when she says, 'Ow. Eye', 'daddy bread', 'I brush my toothes' or 'Me don't want none'? The child is very unlikely to have heard adults produce these strings of words. In fact, even when adults produce a sentence deliberately and invite the child to imitate it, toddlers and preschoolers frequently respond with versions of the original sentence that reflect the processes of selectivity and omission discussed above (Fraser, Bellugi & Brown, 1963).

An influential American linguist, Noam Chomsky (1965, 1972), argued that it is impossible to account for children's language acquisition in terms of traditional learning theories (see chapter 4). As we have seen, children are learning many aspects of language quickly. Chomsky points out that the rules of language children have to master are very complex, and most parents are not able to articulate them. In fact, in much of everyday adult speech we do not even reveal the rules very clearly – we make errors, false starts, inject 'er's and 'um's, leave sentences incomplete. Yet not only do children make rapid progress in their language development (mastering most of the basic rules by about age five), but they are able to create and understand novel linguistic expressions. Chomsky argues that language acquisition in the normal child constitutes 'a remarkable type of theory construction' (1959, p. 58).

Chomsky seems here to be agreeing with Piaget, who also saw the child as constructing theories (see above). But Chomsky took the argument in a different direction. He maintained that any theory involved in coming to grips with a human language has to be extraordinarily complex. It must be general enough to accommodate any language that a child is exposed to, and it must be shared by all normal humans (because we all learn a language, and we all do so at roughly the same pace).

Where could such a theory come from if parents are not able to teach it or even model it? How does everybody get access to it? Chomsky's controversial answer is that it must already be there: the child must have some innate knowledge of what the structure of language will be like. In fact, Chomsky insists that language is not learned at all – it grows and matures, rather like limbs and organs grow.

Chomsky challenged

Chomsky has many supporters, but also many critics. There is much research to confirm that language acquisition is complex and relatively rapid. On the other hand, there is plenty of evidence that parents do play a role in their children's language acquisition. Consider, for example, the research we discussed above concerning the social context of early communication, and the ways in which adults modify their speech for the benefits of the learner (see Durkin, 1995).

There are also objections from Piagetians, who regard language not as an innate, highly specific ability, but as one aspect of the child's broader representational capacity, which emerges during the preoperational period (Sinclair-de-Zwart, 1969).

Social and emotional development

The family is the primary social environment for children during the preschool years, but it is also the base from which they venture into new social contexts. The family is influential in several ways, particularly in the kinds of social behaviour it fosters, and with respect to the kinds of social contacts it offers for the preschooler (Dunn, Creps & Brown, 1996; Schaffer, 1996).

Making friends

Many researchers believe that the patterns of behaviour predominant in the preschooler's home influence the behaviour the child manifests outside the home (Barth & Parke, 1993; Rubin et al., 1998). A good illustration of this principle is Russell and Finnie's (1990) study of Australian preschoolers and their mothers in situations where the child had to join unfamiliar peers. The researchers found that the mothers guided their children towards strategies that affected the child's acceptance. Mothers of popular children suggested ways in which they might join in with peers' current activity, while mothers of children neglected by their peers were more likely to guide them to focus on the materials to hand. There is also evidence that children with a Type B (securely attached) attachment relationship in infancy tend to score higher on measures of social participation with peers at preschool (LaFreniere & Sroufe, 1985). In other words, aspects of the relationship with the primary caregiver are

reflected subtly but influentially in how the preschooler begins his peer relations.

Peer relations among preschoolers show another continuity with early relations: they are selective. Although children of this age will play with a wide array of peers if given the opportunity, they do demonstrate clear preferences (Hartup, 1999). Individuals identify others with whom they play more frequently; they seek out each other's company and they become friends (Hartup, 1999). These early friendships serve a number of important functions, including fostering the growth of social competence and providing sources of emotional support (Asher & Parker, 1989; Erwin, 1993).

The value of these relationships is made clearer by the problems suffered by children who lack them. Unfortunately, some children do not establish friendships and are either neglected or rejected by their peers. Children who experience difficulties like this in the preschool years are at risk of continuing problems in peer relations and personal adjustment throughout childhood and even into adulthood (Coie et al., 1995).

Learning about gender

One of the major areas of social development during the preschool years is learning about gender.

Even in the preschool years, children tend to segregate by gender and to show different behavioural preferences. Boys tend to be more physical and active in their play, while girls often like to play with dolls (Maccoby, 2000). One theory is that these differences reflect biological pre-programming. We know that the young of other species – such as tadpoles – are pre-programmed to develop particular patterns of behaviour according to their gender, and these behaviours underpin later social and reproductive activities, such as patterns of aggressiveness or how they call out to attract mates (Emerson & Boyd, 1999; Summers, 2000). It has been argued that, in a similar way, evolution has designed human males and females for different functions ('males as providers', 'females as caregivers'), and children's play behaviours are early emerging signs of this 'biological imperative' (Hutt, 1978).

An alternative view is that children are 'shaped' by the surrounding culture. Unlike tadpoles, human young receive a lot of direct and indirect advice from their parents about gender expectations. This could serve to reinforce some behaviours (see chapter 4) and extinguish others (e.g. by dressing daughters in pink or telling sons not to cry). Children themselves try to influence each other's gender behaviour, too. Even preschoolers develop strong opinions about how boys and girls should behave. For example, boys might intervene to stop a peer playing with 'girls' toys' (Bussey & Bandura, 1992). Finally, children also receive many stereotyped messages from the larger community and the mass media about gender role expectations (Durkin, 1985).

But some developmentalists have argued that both of these explanations (biology versus environment) overlook a still more basic question: how does a child know that he or she is a male or female in the first place?

This brings us to another aspect of gender role development – cognition, or the child's active search for and interpretation of information about what is expected of males and females (Kohlberg, 1966). Unlike tadpoles, by the end of infancy most children know whether they are a boy or girl and can distinguish men from women (Thompson, 1975). During the next few years, they begin to appreciate how fundamental this distinction is. For example, preschoolers discover an interesting fact about gender that is not apparent to the infant: whichever gender one belongs to, it is going to be a lifelong commitment. While this seems obvious to an adult, it is not understood instantaneously by toddlers.

Children learn the labels for male and female and begin to apply these during their third year of life (Fagot & Leinbach, 1993). Over the next couple of years, they build up an increasing amount of knowledge about what it means to be a male or a female (Martin, 2000), and this learning appears to be linked to broader cognitive development (Szkrybalo & Ruble, 1999). Rather than simply absorbing messages from parents or the mass media, by age four or five children can predict accurately the gender of a person stereotypically associated with a particular activity (such as fixing a car or doing the sewing) before they have actually seen the person (Durkin & Nugent, 1998).

It is clear that, even at this early age, gender is a fundamental category around which the social world is organized, and that children are active in determining their own social experiences.

Figure 9.10

Children receive many messages from the larger community and the mass media about gender role expectations. In the past, these messages have been more stereotyped than they are today.

THE SCHOOL YEARS

Although the school years extend right through to the mid to late teens, we will focus here on the period from around age five to twelve, turning to adolescence in chapter 10.

Middle childhood is a period of relatively steady growth in physical terms, but great progress in cognitive and social development. It is also a period in which individual differences in the rate and extent of development become more evident.

PERCEPTUAL AND MOTOR DEVELOPMENT

By the early school years, children's sensory capacities are generally well developed and, in many respects, functioning at adult levels. Physical development is well advanced, too, though of course the child is still growing and there are certainly many skills that undergo further development. Children are now capable of a wide range of physical activities, and development tends to consist of increasing control and integration of movements (Cleland & Gallahue, 1993; Gallahue, 1989; Krombholtz, 1997).

Individual differences in physical growth and development are influenced by genetic and environmental factors. Some evidence indicates that some disadvantages can persist throughout middle childhood. For example, high proportions of children born prematurely exhibit perceptual–motor problems at age six (Jongmans et al., 1998). Dowdney, Skuse, Morris and Pickles (1998) studied a sample of British children who were exceptionally short at age four. Very small stature tends to be associated with delayed cognitive development. These children also came from economically disadvantaged homes. At age 11, many of these children continued to fare poorly on tests of cognitive abilities compared to a normal comparison group.

COGNITIVE DEVELOPMENT

Once again, researchers' perspectives on this period have been influenced strongly by Piagetian theory – but once again, this is not to say that all researchers accept the details of Piaget's account.

The period of concrete operations

concrete operations period the third major phase of cognitive development, according to Piaget, lasting from approximately seven to 11 years, when the child's problem solving is more logical but his/her reasoning is largely dependent on application to immediate physical entities and tasks

Early in the school years, at around age six or seven, children undergo another major stage transition, entering what Piaget called the *concrete operations period*.

The child can now handle the kinds of intellectual problems that the preoperational child struggled with (such as perspective taking). For example, the concrete operational child is capable of decentration, i.e. taking into account more than one aspect of a problem. He is likely to dismiss scornfully the kinds of responses that a preoperational child gives to a conservation task; for example, on the beaker task the concrete operational child can explain readily that the amount of liquid remains the same, despite changes in visual appearance.

The concrete operational child is able to draw upon logical abilities that Piaget thought were unavailable during the preoperational stage. With respect to the liquid conservation task, these include the ability to:

- reverse the operation mentally (reversibility) – 'If the water filled this much of the first beaker, it must fill the same amount when it is poured back';
- maintain identity (identity) – 'Nothing has been added or removed, so it must be the same amount'; and
- compensate to take account of combined changes (compensation) – 'It's higher, but it's also thinner – these changes cancel each other out, so there's no change in amount.'

The ability to deal with experimenters asking you how much liquid there is in different shaped beakers may in itself seem to be of limited value. However, what is much more important is the breadth of applicability of the underlying cognitive changes mediating performance on these tasks. Conservation ability is fundamental to many other intellectual tasks, and children's education would not proceed far without it. For instance, the achievement of reversibility, identity and compensation underpins much of elementary mathematical and scientific understanding. Consider, for example, how these skills could be used in relation to tasks such as simple numerical operations (e.g. comprehending that if $3 \times 2 = 6$, then $6 \div 3 = 2$), and investigating the interaction of key variables (e.g. comparing the eventual progress of two moving objects, one moving very fast for a short time and the other moving very slowly for a long time).

Other developments and some limitations

There are many other advances during these concrete operational years, too. Children now have greater facility in classifying objects and sorting them into sets and subsets. They appreciate that the same objects could be sorted differently if different criteria were applied (e.g. boys and girls, or blue-eyed and brown-eyed children). They find easy the kinds of seriation (or ordering) tasks that thwarted preschoolers. Their improved grasp of cause–effect relations enables them to comprehend a greater range of phenomena in the natural and social environments. Their greater ability to take other perspectives into account means that they can produce and understand spatial representations, such as maps and diagrams.

All of these cognitive skills afford the child new means of acting upon the world to build greater understanding. But there are still some important limitations. In particular, Piaget saw the concrete operational child's newfound intellectual organizational abilities as restricted to readily accessible (i.e. concrete) contexts, such as immediately present objects and events or easily imagined circumstances. According to Piaget, dealing with abstract ideas and contemplating alternative explanations in the absence

of practical examples came later, in the formal operational period (see chapter 10).

Language and communication

By the school years, typically developing children have mastered the basic grammar of their language and are generally able to make themselves understood as well as understand others. Nevertheless, important developments continue through middle childhood. These include improving phonological skills in co-ordinating speech production, pronouncing multisyllabic words, and understanding speech in noisy contexts (Dodd et al., 2003; Hoff, 2001).

Vocabulary growth continues at an impressive pace (Biemiller & Slonim, 2001), and children become increasingly competent at using and understanding complex grammatical constructions (Hoff, 2001). There are marked improvements in the ability to construct and understand narratives (Hoff, 2001; Low & Durkin, 2000).

As well as improving their use and understanding of language during school years, children also get better at reflecting on language. In other words, they develop metalinguistic awareness – the ability to think and talk about language and its properties (Bialystock, 1993). Ask a preschooler which is the bigger word – 'horse' or 'caterpillar' – and she is likely to answer 'horse'. Young children find it difficult to conceive of the word as an object in its own right. But school age children become increasingly competent in such tasks. During middle childhood, they learn to distinguish words according to whether they obey the phonological rules of their language ('kerpod' versus 'kzkdff') (Edwards & Kirkpatrick, 1999). The emergence of metalinguistic awareness is important because it facilitates many other cognitive and educational processes. For example, once a child knows what words are and is able to conceive of manipulations upon them ('What does "cow" sound like if we take away the "c"?'), he is better equipped to handle the demands of learning to read and write (Tunmer & Chapman, 2002; Wood & Terrill, 1998).

Social and emotional development

While the family remains the principal context of social relations for most children during the school years, interactions with others become much more extensive. Children are learning more about themselves while participating in increasingly complex social networks.

Consider the range of tasks to be met in the course of middle childhood. The young person has to figure out who she is – what makes her unique. This involves discovering her own capacities and limitations (during a period of continual change) and coming to terms with the emotions that these assessments provoke (pride, shame, anxiety, ambition). It also involves comparison with others – we discover ourselves partly through measuring how we stand relative to our peers. In fact, during this phase of life, children come to assess themselves and their peers in increasingly profound ways.

Gender role development

We saw above that during the preschool years, children begin to organize their social worlds around gender and to accumulate information about what it means to be male or female. These processes continue during middle childhood.

By this stage, children know quite a lot about the traditional expectations of their society concerning gender. For example, by the age of five or six years, children have firm views on who will be most competent as a car mechanic or aeroplane pilot, or as a clothes designer or secretary (Levy, Sadovsky & Troseth, 2000; see figure 9.11).

Yet there is a broad difference in terms of how boys and girls conform to traditional roles. During middle childhood, boys tend to follow the requirements of masculinity more rigidly than girls follow the requirements of femininity (Archer, 1992). Cross-sex activities are disapproved of by most boys, while girls are often happy to participate in leisure activities that are perceived as masculine (e.g. some girls of this age will play soccer, climb trees, ride skateboards, wear 'male clothes').

A large study of North American women of different generations found that a clear majority recalled engaging in 'tomboyish' activities during their childhood, with the mean age of starting these activities being five years and the mean age of concluding them being around 12 and a half (Morgan, 1997). This type of behaviour therefore appears to be normative for females and socially accepted as such, whereas the corresponding cross-sex behaviour in boys (e.g. taking an interest in sewing, playing with dolls, dressing up) results in peer hostility and parental concern (Archer, 1992; Raag, 1999).

Seems unfair? Indeed, but this pattern of behaviour during middle childhood seems to reflect a social advantage for males. Archer (1992) argues that because males have traditionally been the most powerful gender, socialization patterns have developed

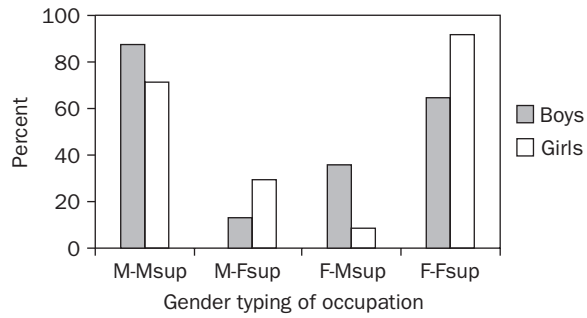

Figure 9.11

Five- to six-year-olds' judgements of who will be most competent in masculine stereotyped occupations (car mechanic, pilot) and feminine stereotyped occupation (clothes designer, secretary).
Key:
M-Msup: Masculine occupations, men rated more competent
M-Fsup: Masculine occupations, women rated more competent
F-Msup: Feminine occupations, men rated more competent
F-Fsup: Feminine occupations, women rated more competent
Source: Based on Levy, Sadovsky & Troseth (2000).

to ensure that young males are prepared for their ultimately dominant role in society. As a result, their gender role may become more rigid during the school years, whereas females are seemingly allowed a longer period of 'gender flexibility', although not an indefinite one, as Morgan's (1997) findings reveal (see also chapter 10).

Peer relations

Middle childhood is also a time of increasing peer interaction. The school years present a dramatic increase in the amount of time spent with peers, and the relationships themselves become more complex as cognitive development progresses and social demands increase.

We saw earlier that preschoolers begin to demonstrate selectivity and preferences among their peers. Although some of these relationships are close and enduring, many are short-lived. If five-year-olds are asked to identify their friends, they will most likely mention whichever peer is nearby, or children with whom they have played recently (Damon, 1983; Erwin, 1993). These affiliations may be quite transitory and subject to termination when disagreements occur. During middle childhood, however, friendships become more enduring, more dependent upon personality compatibility, and characterized by a greater degree of mutual expectation (Damon, 1988; Erwin, 1993; Hartup, 1998).

Researchers have investigated children's concepts of friendship using interview techniques. Typically, interviewers ask questions such as: 'What is a friend?' 'How do you make friends?' 'How do you know someone is your friend?' (Damon, 1983). Younger children (aged four to seven) tend to define friendships in terms of mutual liking and shared activities. Children at this age do have interpersonal expectations (like being nice to each other and sharing toys), but they rarely express psychological dimensions of the relationship. In middle childhood, by contrast, there is more emphasis on provision of mutual support and trust (Erwin, 1993). For example, at around the age of seven or eight, children still tend to describe friends in relatively concrete terms, but they

Everyday Psychology

Gender identity: when boys want to be girls (and vice versa)

Adults often make the throwaway comment that 'boys will be boys' to account for rough-and-tumble games or permanently grazed knees.

But when during childhood does our gender identity become fixed? And what if there is a mismatch between our gender self-identity and the biological sex we have been allocated through our genes?

For most children, their gender identity conforms to the physical body they are born in. But for a small minority of children, this question can raise important issues. When someone's biological sex does not match their gender identity, we use the term gender identity disorder (GID).

People with GID often describe themselves as 'trapped inside the wrong body'. They often have a strong conviction or a wish to belong to the opposite gender. Nobody really knows what determines this self-perception. It could depend on a range of factors working together, such as significant environmental events, hormonal influences or different life experiences at critical points of brain development (these events may occur after birth or in utero).

It is common for children to face gender issues while they are growing up. For example, plenty of girls adopt stereotypically boyish traits, such as cutting their hair short or climbing trees – what we often refer to as being a 'tomboy'. They do not identify themselves as boys or struggle with emotional issues related to their gender.

But in some children, GID becomes a permanent feature of their personality that stays with them into adulthood. Some adults may even elect to have surgery in order to seek to resolve the discrepancy between their appearance and their gender identity.

Children with GID may insist they belong to the opposite sex. Boys may show a preference for cross-dressing or playing the female role, while girls may wear masculine clothing and be drawn towards rough games and contact sports. Children with GID may also choose friends of the opposite sex and show signs of unease about their own body.

To date, GID has been identified more in children who are biologically boys than girls. According to research, roughly six times more boys than girls seek guidance on how to respond to GID. As noted in this chapter, Western society is much more accepting of girls being tomboys than of boys engaging in 'girlish' behaviour. So adults may detect differences in boys' gender-related behaviour much sooner than they would in a girl. So the prevalence of GID may in fact be similar for both sexes, but occurrence in girls is less often picked up.

Most of us feel at ease with our gender, and we tend to assume that other people do, too. But individuals with GID remind us that there is a range of experiences and perspectives even in something as fundamental as which sex people feel they belong to. Developmental–clinical psychologists play an important role in understanding and ameliorating the obstacles and ostracism that some individuals with GID may face.

Bradley, S.J., & Zucker, K.J., 1997, 'Gender identity disorder: A review of the past 10 years', *Journal of the American Academy of Child and Adolescent Psychiatry*, 36 (7), 872–80.

increasingly make references to shared activities and cooperation ('we play soccer together', 'we take turns in goal'). Over the next few years, there is an increasing emphasis on reciprocity, the obligations of friendship and the psychological characteristics of friends ('she's kinda shy, but she stands up for me and I'd do the same for her').

This is not to suggest that friendships are invariably harmonious. In fact, during middle childhood relations with friends can involve a great deal of conflict – more so than relations with 'non-friends' (Hartup, French, Laursen et al., 1993). Children at this age learn that relationships have a strong emotional aspect, and that sometimes friendships can be volatile. In short, relationships during middle childhood become more complex as children come to understand more about the nature of people and their interdependencies. In this way, social development is closely interwoven with cognitive development.

FINAL THOUGHTS

Many questions about human psychological development remain challenging and controversial. We do not have all the answers yet, but developmental psychologists are addressing issues that are fundamental to our understanding of the nature of the human mind.

We asked at the beginning of this chapter: how much is given by nature and how much by experience? The most convincing answer would seem to be: a lot of both.

Some capacities emerge very early in human infants, and almost all children do some of the same things on roughly the same schedule, suggesting that development is a natural and predetermined process. For example, we have seen that children can distinguish speech sounds in infancy, their vocabularies explode in the toddler years, and they are quite fluent with complex grammars by the age of four or five.

But what would happen to a child who had no opportunities to talk to other people (i.e. no language experience)? It would scarcely be possible for children to progress in understanding the complex characteristics of other people's attributes, behaviours, thoughts and emotions without extensive experience of the diversity of people and relationships. Nature and nurture are both important in child development – and often so interwoven that they are indistinguishable.

We also asked: how does change come about? Is it gradual or stage-like? For some early psychologists, the answer seemed obvious: children change as a result of learning and the additive effects of experiences. For psychologists of this persuasion, change is externally driven and gradual. Others maintain that the processes are internally driven but responsive to and building on lessons derived from experience. For them, change is domain general and involves radical, stage-like transformations. Yet others see development as domain specific – each domain involving its own structures and principles.

Many of the developments that take place during infancy and childhood remain mysterious, but this makes our investigations all the more exciting. And, as we will see in the next chapter, the developments do not end with childhood.

Summary

- We began in this chapter considering the developmental progression in the tadpole, and reflecting on how the human child's development may be compared to the progression from tapdpole to frog.
- The progression through infancy, the preschool years and the school years takes place concurrently in several important domains: physical and sensory development, cognitive development, language and communication, and social and emotional development. Progression in these separate domains occurs at different rates as the child develops.
- One of the most salient issues that we tackled was the extent to which the human infant's capacities are determined (a) by innate abilities, (b) via interaction with the environment or (c) via a complex interaction of innate abilities and environmental input.
- Piaget proposed a series of orderly sequences (sensorimotor, preoperational, concrete operational) through which the infant and child progresses. Piaget's framework has been very influential, but it has been criticized for underestimating the developing child's abilities because of the way in which Piaget's tasks (such as the conservation task) are presented.
- Language acquisition is one of the most complex and impressive feats that the child achieves. Given the complexity of human language acquisition, Chomsky proposed that this was dependent upon an innate language acquisition device. However, Chomsky's views have been challenged as under-representing the role of the environment in language acquisition.
- Children's emotional and social development can be turbulent, as they face gender stereotyping and peer conflict. Boys develop a more rigid gender role during childhood and adolescence, whereas girls enjoy a longer period of gender flexibility. As friendships become more complex, children begin to understand concepts such as trust, cooperation and obligation, bringing a cognitive aspect to emotional development.

REVISION QUESTIONS

1. What are the arguments for and against stage theories of children's development?
2. When does the infant begin to make sense of the visual environment?
3. Do infants need other people for anything more than food and physical care?
4. Why might a toddler use the same word to convey several different meanings?
5. Are preschoolers egocentric?
6. In what ways do the cognitive abilities of the school age child differ from those of the preschooler?
7. How do children's friendships reflect their cognitive development? Why is acquiring language important for the child?

Further Reading

Durkin, K. (1995). *Developmental Social Psychology: From Infancy to Old Age*. Oxford: Blackwell.
Emphasizes the social contexts of development and the developmental aspects of social reasoning and social behaviour.

Goswami, U. (1998). *Cognition in Children*. Hove: Psychology Press.
A clear account of theory and research on children's developing knowledge and reasoning, covering topics such as learning, memory, problem solving, reasoning and conceptual development.

Hoff, E. (2001). *Language Development*. 2nd edn. Belmont, CA: Wadsworth/Thomson Learning.
An excellent introduction to the study of language acquisition in normal and exceptional children.

Messer, D., & Millar, S. (eds) (1999). *Exploring Developmental Psychology*. London: Arnold.
A useful overview of recent developmental psychology, covering topics in infancy, cognitive and representational growth, atypical development, intelligence, social relations and adolescence.

Muir, D., & Slater, A. (eds) (2000). *Infant Development: The Essential Readings*. Oxford and Cambridge, MA: Blackwell.
Reviews key theoretical issues, and presents an invaluable set of research papers concerned with perceptual, cognitive, social and communicative development in infancy.

Slater, A., & Muir, D. (eds) (1999). *The Blackwell Reader in Developmental Psychology*. Oxford and Cambridge, MA: Blackwell.
Contains accessible and informative articles on a wide range of developmental topics.

Smith, P.K., Cowie, H., & Blades, M. (2003). *Understanding Children's Development*. 4th edn. Oxford: Blackwell.
The ideal next step up for psychology students who wish to pursue the topics introduced here in more detail.

Contributing author:
Kevin Durkin