CHAPTER 3

Developmental psychology

Developmental psychology is concerned with the ways in which people change over their life span, from birth to maturity. Developmental psychologists consider how much of a child's development is influenced by nature and how much is affected by the child's experiences (nurture).

- The first section in this chapter explores the attachment that develops between a parent and a child, and considers Bowlby's theory that mothers and babies have an innate biological need for one another. The section also considers whether behaviourist theory provides an alternative explanation to this maternal relationship. It also considers what happens when attachments go wrong. The core study for this section looks at the relationship between the nature of the attachment formed by a parent and a child, and whether this influences the types of relationship we have as adults.
- The second section looks at cognitive development, particularly Piaget's theory about how children's thinking develops. It also considers Vygotsky's theory as an alternative. The core study for this section is Piaget's experiment into the conservation of number.

UNIT B541

ATTACHMENT

OVERVIEW

An attachment can be defined as 'a close emotional relationship with another person'.

The newborn infant is utterly dependent on others if it is to survive. It needs others to provide food, warmth and protection. In order for the infant to get what it needs it uses innate behaviours such as crying, making eye contact, reaching and grasping, which in turn, invite carers to respond to its needs. Attachments between the baby and the potential carer form from this interaction.

For the first three months of life, most babies respond equally to any caregiver, but then start to respond more to the people who are familiar to them. A baby may wave its arms or smile when it sees its father's face, but there will be little reaction from the baby when it sees a stranger. The baby continues to respond most to those it interacts with frequently until about six or seven months of age. It then begins to show a special preference – an attachment – to certain people. We consider that the baby has formed an attachment to someone when it shows two particular behaviours:

1. **separation protest** – if the baby cries when its mother leaves the room, we conclude that the baby feels insecure when the mother is out of sight
2. **stranger anxiety** – if a stranger comes close to the baby and it moves away from the stranger and towards another person, we conclude that it is fearful of strangers and gains security from this person.

Some babies show these behaviours much more frequently and intensely than others, but nevertheless they are seen as evidence that the baby has formed an attachment when it looks to that person for security, comfort and protection. Such an attachment has usually developed by the age of one.

KEY CONCEPTS

The OCR examination requires candidates to be able to:

- describe separation protest and stranger anxiety as measures of attachment
- distinguish between different types of attachment – secure, insecure-avoidant, insecure-ambivalent.

THE SECURITY OF ATTACHMENTS

The nature of a child's attachment to its caregiver will depend on how confident it is that the 'special person' will provide what it needs. The security of a one year old's attachment to its mother was tested by Mary Ainsworth in a number of studies using what she called the 'Strange Situation' studies. These were controlled observations in which observers noted children's behaviour when mothers and strangers came in to and left the room. Ainsworth concluded that the type of attachment children showed could be classed as secure or insecure – but there were two types of insecurity.

Figure 3.1 This baby may be showing stranger fear

One of the first studies Ainsworth conducted was undertaken in Baltimore, USA, in 1971. Details of the percentage of children showing the three attachment types from this study are shown in Table 3.1. Later studies indicated similar percentages – for example, Campos, Barrett, Lamb, Goldsmith and Stenberg (1983) summarised a number of American studies, which classified children into the three attachment types. They concluded that, in America, 62 per cent of children were found to be secure, 23 per cent were anxious-avoidant and 15 per cent were anxious-ambivalent.

Table 3.1 Ainsworth's three types of attachment (Ainsworth, 1971)

Type of attachment	% of children	Attachment behaviours
Securely attached	70	Happy when mother present, distressed by her absence, went to her quickly when she returned, a stranger provided little comfort
Insecurely attached insecure–avoidant	15	Avoided the mother, indifferent to her presence or absence, greatest distress when child alone, a stranger could comfort just as well as the mother
Insecurely attached insecure–ambivalent	1	eemed unsure of mother, more anxious about mother's presence, distress in her absence, would go to her quickly when she returned then struggle to get away, also resisted strangers.

Ainsworth has been criticised for classifying children's attachment style solely on the basis of the child's response to its mother. The child may have a different type of attachment to the father or grandmother, for example. In addition, some research has shown that the same child may show different types of attachment on two different occasions. It appears that this may be due to changes in the child's circumstances – so, for example, a securely attached child may appear insecurely attached if the mother becomes ill or the family circumstances change.

Studies looking at a relationship between secure attachment and later behaviours have found that securely attached children tend to show the following:

- the ability to get along with others
- good emotional development, showing confidence, trust in others and self-esteem
- flexibility and resourcefulness
- longer attention span, more confidence in attempting problems and using their mothers more effectively for assistance.

One of the psychologists who felt that a secure attachment was the cause of good long-term development was John Bowlby, whose work we now turn to.

OCR EXAM

CORE THEORY: Bowlby's theory

Candidates should be able to:

- explain the concept of monotropy
- explain the concept of a critical period in attachment
- describe the effects of attachment, deprivation and privation
- explain the criticisms of Bowlby's theory of attachment

consider behaviourist theory as an alternative theory, with specific reference to reinforcement in attachment as opposed to instinct.

BOWLBY'S THEORY OF ATTACHMENT

John Bowlby was working from the 1940s until the 1980s. He was a psychoanalyst, believing that early experiences have a profound effect on later life, and his ideas on attachment have been controversial. Bowlby's theory of attachment, outlined in his book, *Childcare and the Growth of Love* (1953), proposed that attachment is innate in both infant and the main caregiver, usually the mother, and that the formation of this attachment is crucial for the infant's survival and development. The key aspects of Bowlby's theory are described below.

- Innate: the infant is biologically programmed to cry, cling, make eye contact, smile and recognise human faces and sounds, and the mother (or substitute mother) is programmed to respond to these behaviours. This results in mutual attachment, and both infant and mother feel anxiety when separated.
- Monotropy: by six to eight months of age the child shows separation anxiety and stranger fear (as we saw in Ainsworth's research), which demonstrates its attachment to the mother. Bowlby claimed that this was its main attachment and was different from all others, so the father had no special emotional importance for the child.
- Development: the mother provides security and a safe base from which the child can explore its world. This unique relationship acts as a role model for all future relationships. Attachment is as essential for the child's psychological well-being as food is for its physical well-being, claims Bowlby.
- Critical period: Bowlby's views were influenced by attachment behaviours in young animals – for example, newly hatched ducklings follow the mother closely wherever she goes. He proposed that the human infant was genetically programmed to

form an attachment, and that there was a critical period between about six months and three years of age during which the baby can most easily form an attachment. Because the critical period is biologically programmed, Bowlby argued that if an attachment has not formed during this time, it will probably be too late.

Bowlby's stress on the importance of this attachment is underlined by his prediction that if it failed to develop, or was damaged in the first five years of life, there would be long-term and irreversible problems in the child's emotional, social and cognitive development. He called this 'maternal deprivation', and we look at this in more detail later in the chapter (page XX).

Criticisms of Bowlby's theory of attachment

Bowlby's theory of attachment offered a comprehensive explanation for the development of attachments. His evidence was crucial in changing childcare practices in, for example, hospitals. For the first time, parents were encouraged to stay with their child in hospital.

Bowlby's theory generated much research, some of which challenged or modified it. For example, children with a poor attachment to their mother do not always have poor relationships with others, whether adults or peers. Critics also argue that the reason for good relationships with the mother and others, or of poor relationships with the mother and others, could depend on how good children are at forming relationships with anyone.

Figure 3.2 Bowlby would say these orphans are likely to have suffered permanent damage because they have experienced maternal deprivation

Below we look at research that criticises Bowlby's claim for a critical period and for monotropy, the special nature of the mother–child relationship.

Is there a critical period?

If children who are not able to form an attachment with their mothers are able to form attachments later in life, after the age of three, this refutes Bowlby's claim for a critical period for the development of an attachment.

Evidence that main attachments can form later comes from a longitudinal study by Tizard, Rees and Hodges (1978). They followed the development of children who had been in institutionalised care (residential nurseries) from only a few months of age until they were three years old. Some were then adopted, some returned to their mothers, some remained in the nursery. There was also a control group: these children had spent all their lives with their own families.

When assessed at eight years old, the institutionalised children who had been adopted had developed good attachments. Their social and intellectual development was better than that of children who had left the nursery to return to their own families. This suggests that there is not a critical period for the development of attachments, and also that the best place for children is not always with their own mothers, which is what Bowlby claimed.

Is there a special mother–child relationship?

Several aspects of this claim have been criticised; the research by Schaffer and Emerson (1964) is an example. They used naturalistic observation and interviews over 12 months to discover more about how infants develop attachments during their first year or so of life. Their results contradict Bowlby because they found that:

- The mother was the main attachment figure for about half the children at 18 months old; for the rest, the father was the main figure.
- Many of the babies had more than one attachment by ten months old; attachment figures included the mother, father, grandparents, brothers, sisters and neighbours.
- Attachments were most likely to form with those who responded accurately to the baby's signals, which Schaffer and Emerson called 'sensitive responsiveness'. If the main carer ignored the baby's signals then there was often greater attachment to someone the baby saw less, but who responded to it more sensitively.

Rutter (1982) evaluated Bowlby's ideas using a wide range of evidence, and concluded that the quality of the child's main attachments is actually very similar, although one attachment may be stronger than the rest. So children seem to form several attachments

at quite a young age, and these are based on the way each person interacts with the child. This suggests that the child's attachment to the mother is based on the quality of the mother's care, rather than any biological factors.

Findings from studies such as these contradict Bowlby's claim that the attachment to the mother is different in quality to any other attachment. Indeed, we have seen that the main attachment may be to the father, who Bowlby claimed was much less important for the child emotionally.

MATERNAL DEPRIVATION HYPOTHESIS

Bowlby's prediction about the long-term effects of a damaged attachment or no attachment at all (which he called his maternal deprivation hypothesis) was based on his work with emotionally disturbed juveniles (young people) during the 1940s.

He investigated their early years using the case study method. This involved interviews, and looking at past school and medical records. Bowlby divided the young people into two groups, with 44 participants in each. One group comprised juvenile thieves, the other consisted of juveniles who were emotionally disturbed but had no known criminal involvement. His results showed that:

- more than half the juvenile thieves had been separated from their mothers for longer than six months during their first five years, but in the other group only two had had such a separation
- several of the young thieves showed affectionless psychopathy (they were not able to care about, or feel affection for, others).

Bowlby concluded that the reason for the antisocial behaviour in the juvenile thieves was due to having been deprived of their mothers' love.

This special attachment to the mother represents an internal working model (or mental model) for the child's relationships with others, proposed Bowlby, so if the child has a secure attachment it is able to form good relationships in later life.

Table 3.2 illustrates what Bowlby meant when he suggested that a person's early attachment relationships can impact on their future relationships.

In a reassessment of Bowlby's ideas, Rutter (1982) put forward the view that Bowlby's emphasis on the importance of attachment behaviour and bonding was correct, but he was wrong to identify the mother as the crucial factor. In particular, Rutter asserts that:

- the damaging influences Bowlby cited were due to a variety of circumstances that have different effects, not simply to 'maternal deprivation'

Mother/care giver relationship	Feelings about mother	Love experience	Self-worth	Feelings about others	Future relationships
My mother is attentive and there for me whenever I need her	My mother is reliable and trustworthy, and this makes me feel safe	I know what it is like to receive uncondition al love (good role model) so will be able to show it to others	I must be a worthwhile person and others will therefore trust and value me	I will trust and value other people because they are generally good	The relationships I have will be equal as I will value that person and they will value me
My mother is not always there and I cannot depend on her	My mother is unreliable although I still have a bond with her, but she doesn't make me feel safe	I do not know what it is like to have unconditio al love or how to it in retu (to or ch an)	Th ust be mething w with e and therefore hers may not value or trust me	I will not value or trust others because they are all probably totally unreliable and inconsistent	The relationships I have with others may well end up being a power struggle as I cannot risk being vulnerable again

Table 3.2 The kind of impact e rly tionships with a primary caregiver can have on future relationships

- the term 'maternal deprivation' masks two very different attachment circumstances – privation and deprivation.

We will look at these points in more detail as we consider privation and deprivation, and how they affect children. Before we discuss the effects of privation and deprivation, we will first clarify what we mean by these two terms.

If you had something you valued and it was taken away, you would feel much more upset about it going than if you had never had it in the first place. Deprivation is when you had something taken away from you – when you are deprived of it. On the other hand, if you had never had it in the first place, this would be privation.

Deprivation

Deprivation occurs when the child has developed an attachment but is then separated from the attachment figure. Rutter (1976) argued

that Bowlby had only found that maternal deprivation was related to long-term problems, not that deprivation was the cause. He studied 2000 boys living on the Isle of Wight and in London, focusing on the relationship between separation and delinquency.

The results showed that when separation was due to the mother's illness or death, there was no correlation with delinquency. However, when separation was due to discord in the family home, or to the mother's mental illness, boys were much more likely to become delinquent. Perhaps an understanding of why the boys' mothers were no longer there affected the way they dealt with their deprivation.

Privation

If a child never experiences the opportunity to form any sort of bond or attachment, this is when privation occurs. This may be because the child has a series of different carers or perhaps family discord prevents the development of attachment to any figure. Children experiencing privation do not show distress when separated from a familiar figure, which indicates a lack of attachment. Many of the juvenile thieves Bowlby studied had had several homes and many carers, suggesting that they could have failed to form any attachments – they were deprivated.

Research indicates that privation may be related to antisocial behaviour, affectionless psychopathy, and disorders of language, intellectual development and physical growth. However, these problems are not due solely to the lack of attachment to a mother figure, as Bowlby claimed, but to factors such as the lack of intellectual stimulation and the social experiences that attachments normally provide. In contrast to Bowlby's claim, such problems can often be overcome later in the child's development, with the right kind of care.

There have been a few case studies of children who have experienced extreme privation, being locked up by their carers, often deprived of food, light and exercise as well as the company of other humans.

In the mid-1980s areas of eastern Europe such as Romania opened up to people from the West and the world a number of orphanages with shocking levels of care. When British teacher Monica McDaid first came across the orphanage in Siret, Romania, she was horrified.

> One thing I particularly remember was the basement. There were kids there who hadn't seen natural light for years. I remember when they were brought out for the first time. Most of them were clinging to the wall, putting their hands up to shield their eyes from the light. (BBC website 2005)

Many of these orphans were taken away from their surroundings and adopted in the USA and the UK. In a follow-up study, carried out by Rutter ten years later, he found that many of the children had not

caught up and were still very affected by their experience. He wrote, 'Contrary to popular opinion at the time, we found there were definite long-term effects from being in an institution' (Rutter 2005).

BEHAVIOURIST THEORY OF ATTACHMENT

An alternative theory to explain attachments comes from the Behaviourist School. Behaviourists believe that all children are born with a 'tabula rasa', or blank slate, and therefore everything they learn is shaped by the consequences of their actions. If they receive good consequences or reinforcement as the result of an action, they are likely to do it again. On the other hand, if there is no consequence, or the consequence is unpleasant, they are unlikely to repeat the action. This technique of behaviour shaping is known as operant conditioning, which we discussed in Chapter 1 (page XX).

Consequently, behaviourists would argue that attachments are formed as a result of the child receiving a some sort of positive reinforcement for developing an attachment to an adult. The baby will initially gaze at the adult, or coo, or even cry, and the adult will respond appropriately by giving attention, changing nappies, feeding the baby or cuddling it. The baby will learn that by interacting in certain ways with the adult, that adult will provide it with what it wants. On the other hand, if the adult does not respond to the baby's demands, the baby will stop demanding and will not see the caregiver as a potential provider. Therefore the attachment of necessity will not develop. This would help to explain why the relationship between the primary carer and the child is likely to be the strongest relationship and why it does not matter whether the primary carer is male or female, biological parent or unrelated. It is the nature of the relationship that is of critical importance rather than Bowlby's argument that attachment development is due to instinctive biological pre-programming.

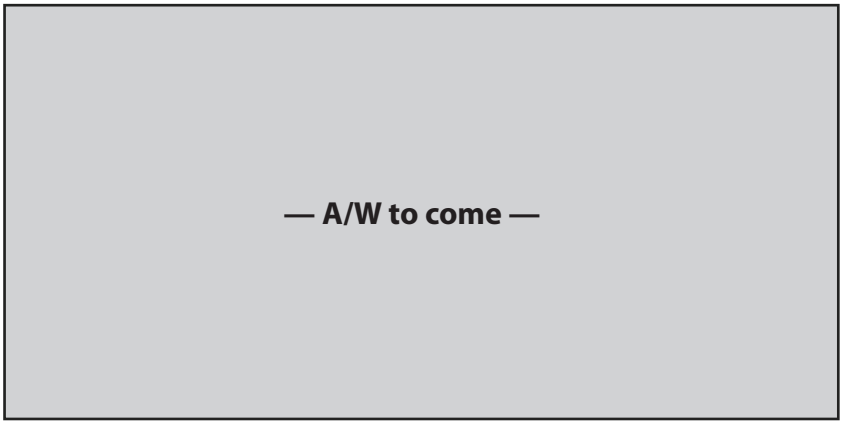


Figure 3.3 Attachment: the baby will initially gaze at the adult, or coo or even cry; the adult will respond by giving attention

CORE STUDY: Hazen and Shaver (1987)

Hazen, R.L. and Shaver, S. (1987) Romantic love conceptualised as an attachment process. Journal of Personality and Social Psychology *52, pp. 511–524.*

Candidates should be able to:

- describe Hazen and Shaver's survey of the relationship between attachment types and adult relationships
- outline the limitations of Hazen and Shaver's study.

Background

The introduction to the study describes aspects of Bowlby's work in a little more detail than we have previously outlined, in order to lead the reader to the aims of the study. Therefore we will consider additional aspects of Bowlby's work, as cited by the authors.

The authors begin by citing Bowlby's work and his interest in the way infants become emotionally attached to their primary caregiver and distressed when they are separated from them. Bowlby believed that 'attachment behaviour' influences a person's behaviour throughout their lives. The authors explain that they were interested in whether or not Bowlby's theory of attachment could help to explain romantic love. They suggest that romantic love is experienced differently by different people, according to their early infant experiences of attachment.

Bowlby's theory developed from observing infants and young children who were separated from their primary caregiver (usually the mother) for various lengths of time. He also considered the work of others when looking at the emotional responses of primates to the same situation. He noticed that, following separation, the infants went through a series of emotional reactions:

- protest – crying, searching for the caregiver and resistance to others trying to console it
- despair – the child becomes passive and sad
- detachment – which was an active disregard for mother and avoidance if she returns (not shown in primates).

Bowlby (1973) summarised his theory into three propositions as follows.

1. When a person is confident that their 'attachment figure' will be available when needed, the person will not be as fearful or anxious as others who do not have that confidence.
2. Confidence in the availability of an attachment figure is slowly built up during the

person's childhood into adolescence. This confidence is likely to remain relatively unchanged throughout the rest of the person's life.

3. A person's expectations as to how accessible and responsive their attachment figure will be generally reflect their early experiences.

The authors go on to explain that a secure attachment relationship is not always guaranteed, and a mother's sensitivity and responsiveness to her child's signals during the first year of life are important for future relationships. Table 3.3 provides a more detailed description of Ainsworth's categories of attachment and Bowlby's equivalent categories.

Ainsworth	Explanation/description	Bowlby	Description
Securely attached		Securely attached	
Insecurely attached Insecure-avoidant	If the mother consistently rejects the infant's attempts to establish physical contact, the infant may learn to avoid her	Detachment	An active, seemingly defensive disregard for and avoidance of the mother if she returns
Insecurely attached Insecure-ambivalent	Mothers who are slow or inconsistent in responding to their infant's cries or who regularly intrude on or interfere with their infant's desired activities (sometimes to force affection on the infant at a particular moment) produce infants who cry more than usual, explore less than usual (even in the mother's presence), mingle attachment behaviours with overt expressions of anger, and seem generally anxious	Protest	Crying, active searching, and resistance to others' soothing efforts

Table 3.3 Ainsworth's three categories of attachment (with Bowlby's alternative descriptions of the two types of insecure attachment)

Source: adapted from Hazen and Shaver (1987, p. 512)

Aim

The aim of the study was to consider whether the three-category theory of attachment could be useful in providing some kind of explanation about romantic love. This led to the formulation of five hypotheses, as follows.

Question 1: Frequencies in the three attachment styles

Can romantic love experiences be categorised in the same way as a child's attachment experiences (as documented by Ainsworth *et al*.)?

The expectation was that it would be reasonable to expect approximately the same proportions as the Campos *et al*. (1983) study (62 per cent secure, 23 per cent anxious-avoidant and 15 per cent anxious-ambivalent).

Question 2: Differences in love experiences

Was Bowlby right when he suggested that the experiences (and therefore attachment relationships) people have with their mothers will result in them experiencing their most important love relationships differently?

The expectation was that:

- *securely attached* people's most important love experience will be characterised by trust, friendship and positive emotion
- *anxious-avoidant* adults' most important love experience will be marked by fear of closeness and lack of trust
- *anxious-ambivalent* adults most important love experience will be experienced as a preoccupying, almost 'painfully exciting struggle to merge with another person' (Hazen and Shaver 1987, p. 513).

Differences in mental models

The authors were also interested in finding out whether participants had different 'working models' of relationships, as suggested by Bowlby (1969).

Question 3: Attachment history links with romantic attachment styles

Is there a possibility that the different characteristics of parent–child relationships (identified by Ainsworth *et al*.) could explain the adults' mental models and romantic attachment styles.

The expectation was that:

- *securely attached* people will think they are likeable, believe in enduring love and find others trustworthy
- *anxious-avoidant* adults are less likely to believe that romantic love will last and believe that they do not need a love partner in order to be happy; they will also hide any feelings of insecurity

- *anxious-ambivalent* adults often fall in love but have difficulty finding true love; they are more likely to have self-doubts than the other two types because they don't try to repress or hide their feelings.

This was assessed by asking participants if they had ever been separated from the parent for 'what seemed like a long time', whether their parents had divorced and how their parent had behaved towards them as a child (participants were asked to choose adjectives such as responsive, caring, critical, intrusive, etc.).

Question 4: Memories of attachment figures

How do people report memories of their attachment figures (either mother or father)?

The expectation was that:

- *securely attached* people will remember their mother as dependably responsive and caring
- *anxious-avoidant* adults will remember their mother as generally cold and rejecting
- *anxious-ambivalent* adults will remember a mixture of positive and negative experiences with their mother.

Question 5: Vulnerability to loneliness

Are people with insecure attachments likely to have less satisfactory relationships and be vulnerable to loneliness?

The expectation was that:

- *anxious-avoidant* adults will be vulnerable to loneliness, but will try to hide this and report less loneliness than the next type
- *anxious-ambivalent* adults will be vulnerable to loneliness.

Methodology and rationale

In order to answer these questions, two studies were carried out. The first, which served as a kind of pilot study, used participants who replied to a newspaper questionnaire.

The authors were aware that the newspaper sample might have been a self-selected sample (people who were interested in taking part rather than a sample representative of the population as a whole) and so they also decided to test a group of college students studying social psychology (Study 2).

They felt that the first study did not investigate any of the participants' mental models (which might have influenced later relationships), or any investigations into loneliness. In order to remedy this, they included new items intended to address this limitation.

The second study also involved using two more questionnaires to gain more information. The authors found that the two sets of data were very similar and this

suggested to them that both groups of participants were representative of the population as a whole.

Note

*In the original study, the information was presented using the standard format of method, results and discussion. The study itself is quite long and complicated, and therefore in order to allow you to compare the methodologies used, these are described first. The results of the two studies have also been put together to make them easier to understand and compare.**

* Text in italics was not reported in the actual study.

Study 1

Method

A questionnaire was used to gather data.

Participants

A total of 1200 people replied to the questionnaire which had been placed in a newspaper, and the authors used data from the first 220 replies. A total of 205 responses were from men and 415 were from women. Their average age was 36 and 42 per cent were married, 28 per cent were divorced or widowed, 9 per cent were co-habiting and 31 per cent were dating.

The questionnaire

The 'love quiz' questionnaire was adapted from previous love questionnaires and was divided into three parts, as outlined below.

The participants were asked to think of their most important romantic relationship and were then asked to think about what this relationship was like. Then they had to put themselves in a category according to how they felt in the relationship: whether they felt securely attached, anxious-ambivalent or anxious-avoidant. In order to do this, they were given descriptions of each category.

1. 56 statements concerning the subject's most important relationship

For example, 'I (loved/love) ..... so much that I often (felt/feel) jealous?'

Responses were recorded by circling one of the following:

strongly disagree/disagree/agree/strongly agree

2. Participants were then asked about the important relationship

For example, questions such as:

- Is the relationship current or is it over?
- What is your relationship to that person now?
- How long did the relationship last?

3. Participants were asked about their attachment style and attachment history

This section dealt with:

- their childhood relationships with parents and the parents' relationship with each other
- questions about how they typically felt in relationships
- what they believed the typical course of romantic love would be (described as mental models).

This involved participants agreeing or disagreeing with the following seven statements.

1. The kind of head-over heels romantic love depicted in novels and movies doesn't exist in real life.
2. Intense romantic love is common at the beginning of a relationship, but it rarely lasts for ever.
3. Romantic feelings wax and wane over the course of a relationship, but at times they can be as intense as they were at the start.
4. In some relationships, romantic love really lasts; it doesn't fade with time.
5. Most of us could love many different people equally well; there is no 'one true love' that is 'meant to be'.
6. It's easy to fall in love. I feel myself beginning to fall in love often.
7. It's rare to find someone you can really fall in love with.

The questionnaire finished with the open-ended question 'Can you add anything that might help us understand romantic love?'

Procedure

The headline in a local newspaper asked people to provide information about their love lives by completing a questionnaire printed in the paper. The instructions included the following sentences:

> The questionnaire is designed to look at the most important love relationship you have ever had, why you got involved in it, and why it turned out the way it did … It may be a past or a current relationship, but choose only the most important one.

Study 2

Method

A questionnaire was used to gather data. The questions asked were the same as in Study 1, although there were additional sections about mental models (see below) and state and trait loneliness.

Participants
A total of 108 undergraduates (38 men and 70 women) with an average age of 18 years.

Materials
A questionnaire asking participants to describe their most important love relationship, using 56 agree/disagree answers.

A further section was included in order to measure mental models *(by which the authors meant the beliefs the participants held about themselves and others)*. Participants were asked to respond to statements such as those listed below.

- I am easier to get to know than most people.
- I have more self-doubts than most people.
- People are generally well intentioned and good hearted.
- You have to watch out in dealing with most people; they will hurt, ignore or reject you if it suits their purposes.

A final section measured 'state' and 'trait' loneliness. State loneliness refers to the position the person finds themselves in – that is, whether they are actually physically alone. Trait loneliness relates to the whole time they feel lonely, because it is possible to feel lonely even if there are lots of people around.

This was done by asking participants to rate statements and questions on a five-point scale. Examples include:

- During the past few years, I have lacked companionship. (state loneliness)
- During the past few years, about how often have you felt lonely? (trait loneliness)

Procedure
The students were asked to fill in a questionnaire as a class exercise and data was analysed by number to ensure confidentiality.

Results

Question 1: The results of Q1 identified the participants' attachment types

Attachment type	Prediction	Study 1: newspaper	Study 2: students
Securely attached	62 per cent	56 per cent	56 per cent
Anxious-avoidant	23 per cent	25 per cent	23 per cent
Anxious-ambivalent	15 per cent	19 per cent	20 per cent

Table 3.4 The frequencies identified in the three attachment types

The results supported the prediction that participants would fall into approximately the same proportions as the Campos et al (1983) study. The results of both studies, when averaged, showed that 56 per cent of the participants classified themselves as securely attached, approximately 24 per cent as anxious-avoidant and approximately 20 per cent as anxious/ambivalent.

Question 2: Differences in love experiences

Table 3.5 shows the predictions of the authors about the differences in the love experiences of the participants, together with their actual experiences.

Attachment type	Prediction	Study 1 Newspaper	Study 2 Students
Securely attached	Characterised by trust, friendship and positive emotions	Especially happy, friendly and trusting (average duration of relationship – 10.02 years, low per cent divorce rate)	Friendly happy and trusting
Anxious-avoidant	Marked by fear of closeness and lack of trust	Experienced fear of intimacy, emotional highs and lows, and jealousy (average duration of relationship – 5.97 years; 12 per cent divorce rate)	Marked by fear of closeness
Anxious-ambivalent	Experienced as a preoccupation, almost 'painfully exciting struggle to merge with another person'	Characterised by obsession, desire for reciprocation and union, emotional highs and lows, and extreme sexual attraction and jealousy (average duration of relationship – 4.86 years; 10 per cent divorce rate)	Marked by jealousy, emotional highs and lows, and a desire for the partner to return the same feelings of love

Table 3.5 The authors' predictions about the love experiences of the participants, together with their actual experiences

Note: The average length of relationship for Study 1 was eight years; the average length of relationship in Study 2 was one year.

The second prediction was that there would be different kinds of love experiences for people in the three attachment-style categories. The results supported the idea that there were three different styles of love rather than three different points on a continuum, although the authors believe that there is a 'core experience of romantic love'.

Because the students were much younger than the newspaper respondents, they had not had as much experience of relationships.

Question 3: Attachment history links with romantic attachment styles

The participants were asked to either agree or disagree with seven mental model statements about love. The results from both studies indicated that attachment type affects individuals' beliefs about the course of romantic love and the availability and trustworthiness of romantic partners. Not surprisingly, the students were also more likely than the newspaper respondents to believe in the romantic, 'Hollywood' idea of love. One reason for this might be that the college students had had fewer relationship experiences and were still idealistic!

Differences in mental models (new items)

The differences between attachment styles was evident in six out of eight of the newly added mental models section in Study 2.

- *Securely attached* students described themselves as easy to get to know/liked by most people/believe that others generally have good intentions and are kind hearted.
- *Anxious-avoidant* students provided mental models more like the anxious-ambivalent than the securely attached although they were less extreme. They also had to watch out when dealing with new people and believed they were able to get on by themselves.
- *Anxious-ambivalent* students had more self-doubts, thought they were often misunderstood and underappreciated and found others less willing to commit themselves to a relationship.

The third question was asking whether the type of attachment experiences the participants had would affect their internal models of relationships. The authors found that the results supported the hypothesis by showing that people with different types of attachment experiences hold different beliefs about the course of romantic love, how available and trustworthy love partners are, and how worthy they were to be loved.

They conclude that experience affects our beliefs about ourselves and others, and these beliefs affect the way we behave and the likely outcomes of any relationships we may have.

Question 4: Memories of attachment figures

In Study 1, there was no difference between the groups in the numbers of respondents who had been separated from their parents or whose parents had divorced. However, respondents reported differences in the quality of their relationship with parents and their parents' relationships with each other.

Table 3.6 illustrates the difference in the anxious-avoidant participants' reports of parental relationships.

Description	Study 1: newspaper	Study 2: students
Accepting mother	12 per cent	50 per cent
Sympathetic mother	32 per cent	79 per cent
Happy parental relationship	29 per cent	63 per cent
Good humoured	19 per cent	54 per cent

Table 3.6 Anxious-avoidant participants' reports of parental relationships

- *Securely attached* people reported warmer relationships with both parents and between both parents.
- *Anxious-avoidant* adults described their mothers as cold and rejecting.
- *Anxious-ambivalent* adults saw their fathers as unfair.

In Study 2, the results were very different. The avoidant subjects provided answers that were similar to those of the secure subjects and sometimes described their parents more favourably. They also gave more negative descriptions, such as 'critical, rejecting, and disinterested', than the other groups.

The authors suggest that the students gave these answers as they were being defensive. This idea was supported by Main *et al*. (1985), who showed that avoidant adults and college students are likely to idealise their relationships with parents to make them feel better if the relationship is poor. It was only when they become more mature and moved away from their parents that they were able to be honest and acknowledge the really negative aspects of their early relationships.

Question 5: Vulnerability to loneliness

The results supported this suggestion, with the highest loneliness scores coming from the anxious-ambivalent students and the lowest ones from the securely attached students. Further analyses of the data indicated that anxious-avoidant students admitted being distant from other people but did not report feeling lonely.

Loneliness type	Securely attached	Anxious-avoidant	Anxious-ambivalent
Trait	2.01	2.30	2.59
State	2.21	2.57	3.02

Table 3.7 Average trait and state loneliness scores (on a five-point scale)

This hypothesis predicted that the insecure participants would feel more lonely than the secure participants (especially the anxious-ambivalent participants). These results fit with other findings that the anxious-ambivalent adults really want an intense relationship that is all-consuming and probably overpowering. However, they are less likely to find partners to return this level of intense commitment, and are thus more likely to feel 'alone' than the other groups.

Conclusion

The authors suggest that romantic love is a biological process that supports the development of attachments between sexual partners who are likely to become parents. Relationships start with a romantic beginning when the lovers are fascinated and preoccupied with each other. They then move into the period of secure attachment. The relationships that break down can be seen, in part, to mirror the person's previous attachment bonds. They also suggest that 'loneliness and grieving are often signs of the depth of broken attachments'.

Limitations of the study

The authors identify some limitations of the study, but there are other aspects of the study that need to be considered.

- The two groups of participants were not representative of the population as a whole, although the results suggested that the two groups were representative of each other.
- Were all the participants told the purpose of the study and did they give informed consent?
- There were not equal numbers of male and female participants.
- The participants were asked to categorise themselves into one of the three groups by thinking about their love relationship. The question is whether they were able to categorise themselves accurately – they may have chosen the wrong category because they felt one was more socially desirable than the other, or they may just have been very poor at assessing themselves.
- The participants were also classifying themselves by a current relationship rather than their relationship with their parent. Perhaps this resulted in them classifying themselves in a different way, especially if their current relationship was not going well.
- The method used self-report measures. Participants provided information about their relationships with others, which were not checked for accuracy.
- Every relationship we have in our lives is unique and often we have more than one serious love relationship. Perhaps the participants would have given different answers with a different relationship.

APPLICATION OF RESEARCH INTO ATTACHMENT: Care of Children

Candidates should be able to:

- explain how psychological research relates to care of children – for example, dealing with separation in nurseries, encouraging secure attachments through parenting classes, dealing with stranger anxiety in hospitalised children.

CARE OF CHILDREN

Research into attachment has influenced our knowledge as to the best way of caring for children. For example, we know from Bowlby's research that disruptions in early childhood relationships may have lasting effects on the child's ability to form long and meaningful relationships as an adult. Ainsworth's research has also indicated that the nature of attachment relationships can affect the child's ability to get along with others, their emotional development, their resourcefulness, attention span and confidence in attempting problems.

It is now generally understood that children need to have a responsive and consistent attachment figure. We also understand from Rutter's research that children can respond to more than one attachment figure, and that it is not necessarily the mother. This has significant implications for the care of children who enter nurseries or who are hospitalised.

Nurseries

It is now much more common for both parents to work, and childcare is a challenge for parents to manage. Therefore many more children attend nurseries than ever before, going from a very young age through to school entry. Although there have been concerns regarding the welfare of children who go to nurseries and the disruption to their attachment relationships, research has shown that if the nursery provides good day care the experience is not harmful and can, in some cases, be beneficial (Lamb 1998).

The selection of a nursery is very important.

- The staff need to be well qualified and sensitive to the children's needs.
- There should be a low staff turnover in order to allow relationships to develop between staff and children, and to provide consistency.
- There should be a high caregiver-to-child ratio (ideally no more than one to four).

Figure 3.4 This nursery class is homely yet stimulating, with a responsive adult to a small number of children

- More than one member of staff should develop a relationship with the child so that if one is absent this does not disrupt continuity of care for the children.
- There should be lots of language and play through conversation, games and songs.
- There should be toys and equipment to stimulate the child and allow the development of reciprocal play.
- Good routines and consistent behaviour management are vital.

Once parents have selected a nursery, the most effective way of reducing any separation anxiety is to try to develop the relationship between the nursery staff and the child before the mother (or caregiver) leaves. This can be done by mother and child attending the nursery on several occasions before leaving the child for the first time. When the child is mobile, and the relationship between the mother and child is 'secure attachment', the child will use the mother as a 'safe base' from which to explore the nursery. This is where the staff members can start to establish the relationship with the child.

If the mother has pictures of the nursery and the staff, and takes them home to talk about them and the activities that take place in the nursery, the child will start to make links between the two places and the fear will reduce. The nursery staff need to be sensitively responsive to the needs of the child when she or he is in their care, and to provide the safe base from which the child can start to learn. It is really important that the mother collects the child on time and that she continues to maintain the relationship by giving the child 'quality time' once they are home. This suggests that part-time work is probably the most beneficial, allowing the mother to spend time with her child.

Parenting classes

Parenting classes are available for some parents, but usually those who are experiencing difficulties managing their children's behaviour.

Organisations such as Barnardo's and Action for Children provide classes for such parents. However, prevention is better than cure and it is more important to help children develop secure attachments to their parents by helping the parent become sensitive and responsive to their child's needs.

We know that there are a number of parents who have had a difficult childhood and perhaps have not had the best role models themselves. Also the high levels of divorce and reconstituted families (families where two partners have brought their own children from previous relationships), mean that there is sometimes little time to nurture secure and consistent relationships. In fact, a large number of children with social, emotional and behavioural difficulties come from families where their needs are not being met because of social problems.

Classes focus on areas that are intended to help develop relationships in a firm but fair way, by supporting parents in the following ways:

- how to really notice and be sensitive to your child
- how to respond to your child
- how to understand your child
- how to be firm but fair
- how to be consistent
- how to develop language
- how to play.

Dealing with stranger anxiety in hospitals

In the past, the importance of relationships in a child's relationship with the primary caregiver was not understood. For example, parents of young children who had to go into hospital were restricted in their visiting, leaving children, even those who had long-term illnesses, separated from their parents. Research by Robertson and Bowlby (1952) considered the impact on children of separation from their parents, after observing children in hospital. They believed that this enforced separation would have a significantly disruptive effect on the relationship in the future.

We also know that children experience stranger anxiety at about the age of seven months, using their safe and secure attachment figure to cling to when anxious. When a young child is hospitalised, they will have to deal with a large number of strangers – for example, they will meet doctors and nursing staff, but they might also encounter physiotherapists, occupational therapists, radiographers and ancillary staff. The most effective way of helping them deal with the anxiety of these meetings and the pain of separation is to allow the child's secure attachment figure, who may be the mother or father, to remain in hospital with the child.

In fact this practice is now common in all hospitals, with parent rooms being made available or parents remaining by the bedside of the child at all times. This has prevented the traumatic responses that children experienced in previous generations.

UNIT B542

COGNITIVE DEVELOPMENT

OVERVIEW

If your parents tell you about things you said or did when you were little, it is often really hard to believe that they are telling the truth. However, our understanding of the world does change as we grow up and we do think of things in a different way to the way we thought about them as children. For example, imagine that your teacher shows you two pieces of string of the same length side by side and then scrunches one up – you would know it was still the same length as the other one, but a four-year-old child would not. The difficulty is that we forget as we get older that young children do see the world differently to us and find it hard to understand things that we take for granted.

Developmental psychologists consider the stages of development that a child goes through before they reach maturity, in order to understand some of the changes that occur in a child's thinking or cognition. We are going to consider two of the most influential theories of cognitive development in this section, starting with the work of Jean Piaget, who developed a theory of how thinking, or cognition, develops from infancy to adulthood.

KEY CONCEPTS

The OCR examination requires candidates to be able to:

- describe how cognitive development occurs in invariant and universal stages
- outline the stages of cognitive development – sensori-motor, pre-operational, concrete operational and formal operational.

JEAN PIAGET

Jean Piaget was not actually a psychologist, which is quite surprising when you consider how important he is in the world of

developmental psychology. He was born in Switzerland and initially trained as a biologist and zoologist. Piaget went to work in Paris in the 1920s, helping Theodore Simon and Alfred Binet to develop the first intelligence tests for the French Education Department, so that they could identify children who had learning difficulties.

In Jean Piaget's early work with children he asked them questions, and was interested to discover that when children gave the wrong answers they were often the same kind of wrong answers. He proposed that the way children think is different from adults, and that it develops in stages from infancy to adulthood. Piaget argued that these changes in thinking are biologically based. This means that every child goes through these same stages in the development of their thinking (or cognition) as they mature to adulthood.

Piaget claimed that once a child reached a certain stage then they could not return to a previous stage. He claimed that each stage, or step, was like a building block and was dependent on having reached the previous stage first. The stages were therefore invariant (did not vary from one child to the next) and were universal because *all* children, from *any* culture, went through every stage in the same order.

As Piaget worked with children he came to the conclusion that they were actively trying to make sense of the world – he called them 'little scientists' because of the way they explore and test. They do this using what motor skills they have. For example, a baby's grasping ability is inborn (or innate) and the baby will use this ability to grasp in order to hold on to something such as fingers or clothes. The baby at this point has a mental structure, or schema, which contains all it knows about holding on to something.

When the 'little scientist' explores its world, it will come across a situation for which its present skills are inadequate – for example, it may be given a bottle of milk (assuming its mother is not there to feed it). It will use what it already knows to hold on to the bottle, but at this point it may find that its existing schema is inadequate because, for this action, it will have to change the shape of its hands and make them work together. The baby has to **assimilate** the new information (bottle is a different shape, need two hands, and if I put the end of it in my mouth something nice comes out) and then adjust its existing schema to **accommodate** the new information. What the baby has done is to adapt to a new situation through assimilation and accommodation, and it will use this new holding skill again and again in many situations.

OCR EXAM

CORE THEORY: Piaget's theory

Candidates should be able to:

- describe the concept of object permanence
- describe the concept of egocentrism and the process of de-centring
- describe the concept of conservation
- explain the criticisms of Piaget's theory of cognitive development
- consider Vygotsky's theory as an alternative theory, with specific reference to the zone of proximal development.

PIAGET'S THEORY OF COGNITIVE DEVELOPMENT

Piaget identified four stages of cognitive development, and you will see shortly that children's thinking changes in each of these stages; these changes develop through the processes of assimilation and accommodation. We will now look at each of the stages, focusing on research that demonstrates what the child can, or cannot, do.

Sensori-motor stage (birth – two years)

The baby explores its world using its senses (sight, sound, taste, touch, and so on) in combination with body movements. Initially these movements are reflexes, such as the grasping or sucking reflex, and they form the basis for its exploration. For example, the infant watches a moving object, reaches out towards it and after many attempts is able to grasp it. A few weeks later the baby will then be able to bring the object to its mouth, and explore it using its sense of taste and smell. Gradually these skills develop and become more complex.

Object permanence

One major characteristic of this stage is the development of object permanence. To begin with, the baby lacks object permanence: it acts as though objects no longer exist if they are not seen. When Piaget shook a toy in front of a four month old it reached out for it. Then a cover was placed over the toy, and the baby looked away and appeared to lose interest, as though the toy had never existed. When Piaget repeated the actions in front of an eight month old, the baby continued to reach for the toy, sometimes showing distress at its disappearance.

Figure 3.5 This baby is using its sensori-motor skills to understand its world

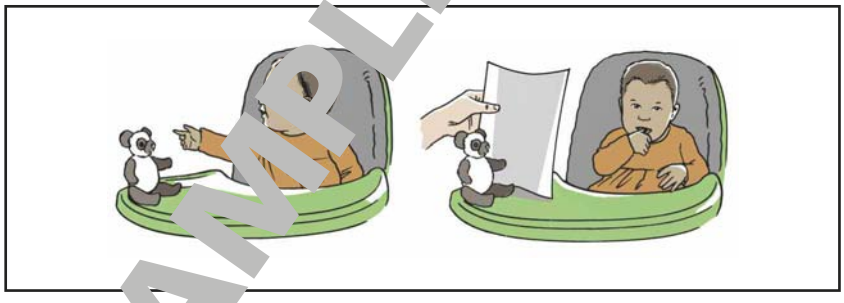


Figure 3.6 The child loses interest in the toy directly it is covered up

From this behaviour Piaget inferred that, by eight months old, the child has developed an internal representation (or image) of the object which is why it continues to reach for it and show distress that it has disappeared. The baby has therefore achieved object permanence.

Evidence from studies of attachment support Piaget's claim that once the baby develops a mental representation of an object, it understands that it still exists even though it is not seen. Young children demonstrate stranger fear at about eight months of age (see page XX). According to the concept of object permanence, they have developed mental representations of the people they are attached to, so that when someone appears who does not match any of those representations, the child shows alarm or fear.

Pre-operational stage (two–seven years)

By two years of age the toddler starts to use symbols, signs or objects to represent things. This is an example of symbolic thinking, which is when we make something 'stand for' something else. For example,

the three year old will use a cardboard box as a house or a car. Language is evidence of symbolic thinking, because the child knows that when you say 'table' the word 'stands for' an actual table – he could draw one or point one out in the room, or tell you how you could use a table. Piaget said that language skills develop as a result of the child's cognitive development.

Children in the pre-operational stage demonstrate the following characteristics.

- **Animism**: children up to about four years old think that inanimate objects have feelings like they do (this is animism), saying, for example, 'The flowers are tired' when flowers are wilting.
- **Egocentrism**: have you ever played hide and seek with a three year old who hides by standing in front of you covering her eyes? Because she cannot see you, she thinks you cannot see her; this is an example of egocentric thinking (or egocentrism). An egocentric child can see the world only from their point of view, not understanding that other people may have different experiences or may see things differently to them. Egocentric children also focus, or centre, on one aspect of a situation or problem (which helps to explain why young children have difficulty with conservation; see page 134). **Centration** was the term Piaget used for this focus on only one feature.

Piaget and Inhelder (1956) devised the 'three mountains' task to test children's egocentric thinking (see Figure 3.7). For this task, a child sat at a large, table-top model of three mountains and was asked what he could see from his side of the table. A doll was then placed at various positions around the table. The child was shown photographs of the mountains taken from these different positions, and asked to indicate which of them showed the doll's view.

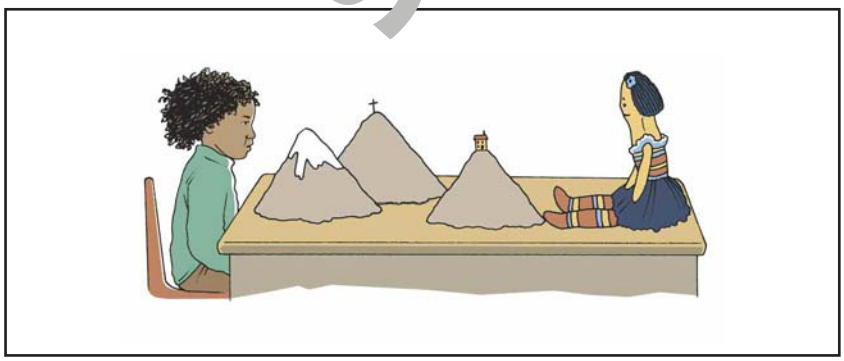


Figure 3.7 A child doing the three mountains task – the 'doll' in this photograph is a tiny clay model; you can see the pictures on the table, which represent the views of the model

Four- and five-year-old children thought the doll's view would be the same as their own, which indicates egocentrism. However, most seven

year olds identified the doll's view correctly, which suggests that their thinking is no longer egocentric.

Conservation

During this stage, children are unable to conserve number, length, quantity, mass, weight and volume. Their understanding is dominated by the appearance of something and so they do not understand that a quantity of something will remain the same when it is presented in

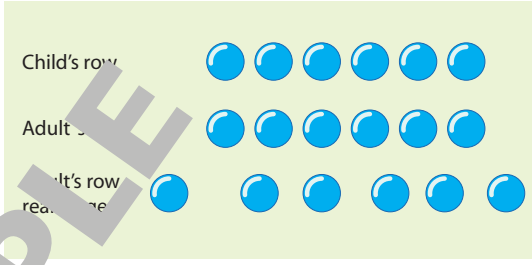
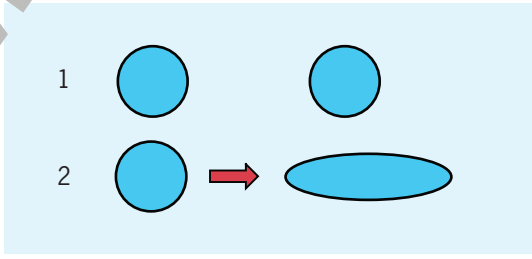
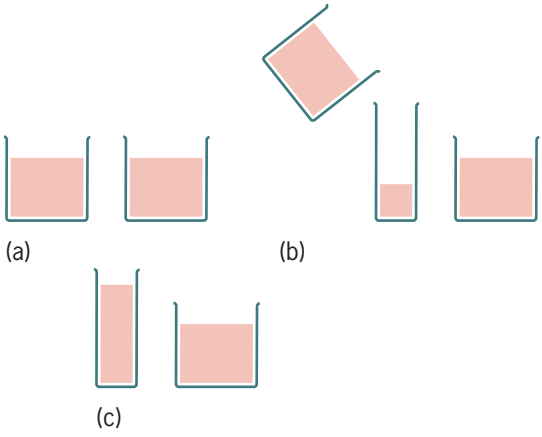
Conservation	Method	Apparatus
Number	Two rows of equal numbers of counters, laid out in parallel with the items matching. The child is asked 'Are there the same number of counters?' One row is stretched or rearranged, and again the child is asked 'Are there the same number of counters?'	
Mass	Two identical pieces of clay are shown to the child (1). 'Is there the same amount of clay in each?' One is rolled out into a sausage shape (2) and the child is asked 'Is there the same amount of clay in each?'	
Volume	Two equal-sized glasses have the same amount of liquid in each. The child is then asked 'Is there the same amount of liquid in each?' The liquid from one is poured into a taller glass. The child is then asked again 'Is there the same amount of liquid in each?'	

Table 3.8 Studies of conservation of number, mass and volume: an overview

a different way. Piaget undertook a series of experiments to test children of different ages' ability to conserve (described in detail in the core study for this chapter, page XX). Table 3.8 offers a brief description of studies that have looked at the conservation of number, mass and volume.

Children's responses to each of these tests would have been focused on the appearance of the objects, so the answer to the second question in each conservation experiment would have been 'No'.

Concrete operational stage (seven–11 years)

Early in the concrete operational stage the child starts to be able to de-centre, which means that they are able to understand that people see things differently from them.

- They would be able to identify the doll's view in the three mountains task.
- They understand that objects can belong to more than one class – for example, they would be able to think of their mother as a mother and as an aunt.
- They are also able to conserve – they can now understand that something is the same, even though its appearance changes. Conservation develops slowly but in the same order, with conservation of number appearing by about seven years of age, then mass and length between seven and eight, then weight between the ages of eight and ten and finally volume by 11 to 12. However, the children in this stage need to have the actual objects present in order to complete the task (which is why it is called the concrete operational stage).

Formal operational stage (11 years and older)

The child in the previous stage could manipulate things, but in the formal operational stage the child can manipulate ideas. A simple example is the ability to envisage relationships, as in the following problem:

- If Mark is taller than Ali, and Mark is smaller than Kerry, who is the tallest?

In the previous stage the child would have to draw a picture or use different-sized objects to solve this problem. Now the child can manipulate the ideas in her/his head. It can do mathematical calculations, think creatively, imagine the outcome of particular actions.

According to Piaget, once the young person has achieved formal operational thinking, there is no further change in the structure of thinking, only in the complexity, flexibility and level of abstraction.

Criticisms of Piaget's theory of cognitive development

Although Piaget's theory has had a tremendous impact on our understanding of children's development, much of the criticism focuses on the fact that his work provided more of a description of cognitive development than an explanation for it. Children's development seems to be more continuous than the stages (or steps) Piaget identified. His ideas suggest that if a child progresses up to the next stage, this implies that this new stage of reasoning is going to affect every area of the child's life, whereas progress does not seem to occur in such an all-or-nothing way. In fact, other researchers, such as Flavel (1993) and Schaffer (2004), dispute the suggestion that cognitive development is global, and suggest that children progress in certain areas quicker than in others.

Piaget used three methods in order to formulate his theory. These were naturalistic observations, clinical interviews and experiments.

- **Naturalistic observations:** these observations were mainly of Piaget's own children and he was the only observer. He may have been biased or misinterpreted what he observed. Generalisations should not be made from informal research such as this, but Piaget did generalise and many of the ideas in his sensori-motor and pre-operational stages are based on these observations.
- **Clinical interviews:** Piaget asked children questions, and if they did not understand he altered to make the question clearer. If they then gave an interesting answer he pursued it. Therefore, the information gathered depended on the types of questions asked and the child's willingness to respond.
- **Experiments:** he began to use formal experiments, manipulating variables and treating all the children in much the same way, with standardised tasks and instructions. However, he always had very small samples and therefore the children selected may not have been representative of all children of the same age (see Chapter 6).

Concerns have also been raised about the procedures used, as noted below.

- **Instructions:** Piaget used instructions that might have been confusing to the children (see the section on Rose and Blanks' (1974) research, page XX).
- **Data gathering:** a challenge for anyone who studies young children is finding a way of assessing just what the child understands. Research on babies is restricted because they cannot use language, so their understanding must be inferred from observing their behaviour. Even when children are a little older, their language skills are limited, and this affects their ability to follow instructions, understand questions and express themselves accurately. Piaget himself argued that the development of language depends on cognitive development, so a child who understands a particular

concept may still not have developed the language skills to talk about it. Therefore the data gathered may have been incomplete, and he may have underestimated the skills of the children he worked with.

- **Egocentrism:** the changes in intellectual development identified by Piaget occur at a younger age than he claimed. This may have been because of the methodology he used, which was not always ideal for the children. For example, Piaget's three mountains task asked children to identify what a doll could see from a series of model mountains. This study has been criticised because it did not make sense to the children tested. Were the children actually familiar with mountain scenery? Did the mountains really look like mountains? It was also made more difficult because the child had to match the doll's 'view' with a photograph.
- **Object permanence:** research on object permanence has shown that children do not lose interest when they can no longer see an object. In Bower and Wishart's (1972) experiment, babies less than four months old were filmed in a laboratory using an infra-red camera. A toy was offered to the baby, but as it reached for the toy, the light in the laboratory was switched off. The infra-red camera showed that the baby continued to search for the toy, even though it was no longer visible.
- **Conservation:** several aspects of the conservation tasks have been criticised – for example, that they fail to take account of the social context of the child's understanding. Rose and Blank (1974) argued that when a child gives the wrong answer to a question, adults often repeat the question in order to hint that the first answer was wrong. This is what Piaget did by asking children the same question twice, before and after the liquid was poured into another glass. By doing this he suggested that the child's first answer ('They are the same') was wrong, so the child changed its answer.

When Rose and Blank replicated this experiment but asked the question once, after the liquid had been poured, they found many more six year olds gave the correct answer. This shows children can conserve at a younger age than Piaget claimed, and suggests that the design of his experiment prevented them from showing this ability.

Piaget's theory has had a major influence on our understanding of cognitive development, and has provided a framework for research. Aspects of it have been challenged and alternative explanations have been offered, but the abilities he identified and the sequence of their appearance remain intact. His ideas have been widely accepted and used to enrich children's cognitive development in school and pre-school settings.

It is sometimes written that Piaget saw the child as a scientist, indicating that children adapt to their environment and construct their own understanding of the world through their experiences.

Therefore a rich environment provides the basic canvas for children to develop cognitively. Piaget did not specify that social experiences were necessary for this development to take place. This is in total contrast to the view of Vygotsky, a Russian psychologist, who strongly believed that a child's cognitive development is dependent on social experiences. He saw the child not as a scientist, but as an apprentice who acquired knowledge and skills through interactions with others.

VYGOTSKY'S THEORY

Vygotsky (pictured) was born in Russia in 1896, the same year as Piaget. He studied at the Institute of Psychology in Moscow, where he developed his ideas about cognitive development. His work was available outside Russia only from the 1960s, although he actually died of tuberculosis in Moscow in 1928 when he was only 32 years of age.

Piaget approached the process of children's development from a biological perspective, suggesting that maturation is the key to development – to put it simply, that child development is dependent purely on age. Vygotsky, on the other hand, believed that children are born with a whole range of perceptual, attentional and memory capacities, but these could be transformed through socialisation and education. What he was suggesting was that children mature *because* of their experiences, though he did acknowledge that they also have to be physically mature enough to achieve certain levels of development and that, without those experiences, children remain immature. He focused specifically on social experiences, especially with parents and the social experience of the culture in which we grow up.

Table 5.1 illustrates the difference in Piaget's and Vygotsky's focus. Piaget focuses on stages, whereas Vygotsky identifies important influences on children's development.

In order to compare the ideas of Piaget (biological maturity) and Vygotsky (social interaction) we could take the example of language, which we know Vygotsky felt plays a key part in development. We know that very young children cannot speak because their palate is the wrong shape. It is only physical maturity that allows the infant to make meaningful sounds. However, if that child is totally isolated and is never spoken to, they will not develop the ability to use language no matter how old they are. In fact several studies of children who had been brought up in severely deprived conditions showed how social contact was essential for not only the development of language, but also their overall development – for example, the case of Genie (Curtiss 1977) described in the box.

Age/stage	Piaget	Vygotsky
Infancy 0–2 years	Sensori-motor	Affiliation (caregivers)
Early childhood 2–7 years	Pre-operational	Play (peers)
Middle childhood 7–12 years	Concrete operational	Learning (teachers)
Adolescence 12–19 years	Formal operational	Peer group
Adulthood 19–55 years		Work
Early old age		Theorising

Table 3.9 The differences in Piaget's and Vygotsky's [illegible]us

Source: adapted from Cole and Cole (1993)

The story of Genie

Genie was discovered in 1970 after [illegible]ing been locked in a room alone for over ten years. She is one of the most famous cases tha[illegible]ave considered the effects of social deprivation on development (especially lan[illegible]ua[illegible]

Genie's mother was partial[illegible] blind[illegible]nd her father had mental health problems. When she was less than two years o[illegible]ag[illegible]er parents were told that she may have significant learning difficulties and, in orde[illegible] to 'protect her', her father decided she should be confined. She was kept in her [illegible]oom, tied to a potty chair and left to sit alone day after day. At night she was tied in to a sleeping bag and placed in an oversized cot with a metal top. Genie was brought up in a state of severe sensory and social deprivation; no one spoke to her and if she made a noise she was punished.

When she was found, aged 13, she spoke only two words, 'stopit' and 'nomore'. She had a strange 'bunny' walk and held her hands up in front of her like paws. She could not eat solid food and found it hard to swallow. She looked about six years of age, weighed just over four stone and was 4 foot 6 inches tall. She found it hard to see anything further away than 12 feet and was not toilet trained.

Vygotsky also believed that culture plays a large part in children's development (hence why his approach is sometimes called a **socio-cultural** approach). Piaget suggested that children learn through exploratory learning, and therefore a rich environment with lots of opportunities to learn by trial and error would be the ideal. On the other hand, Vygotsky pointed out that children can learn from others

about various skills such as how to mix colours in art, how to cook or how to behave in different situations, without having to find out for themselves. This cultural knowledge can be handed on without the child having to learn by trial and error. The child can then, in turn, hand the same skills on to the next generation.

Zone of proximal development

Vygotsky identified the importance of social influence on children's development by explaining that adults provide **scaffolding** to help them learn. He believed that children are able to demonstrate certain abilities on their own, but with help and guidance from others, they can actually achieve more. This help and guidance, or scaffolding, may start off being really directive, but can slowly be withdrawn as the child becomes more capable and manages to do things or reason out complex problems on her or his own.

The difference between a child's independent achievements and their potential achievements is called the **zone of proximal development**. The people who can help and guide them do not have to be adults – they could even be other children who are more capable. As Vygotsky says:

> The zone of proximal development … is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (Vygotsky 1978, p. 86)

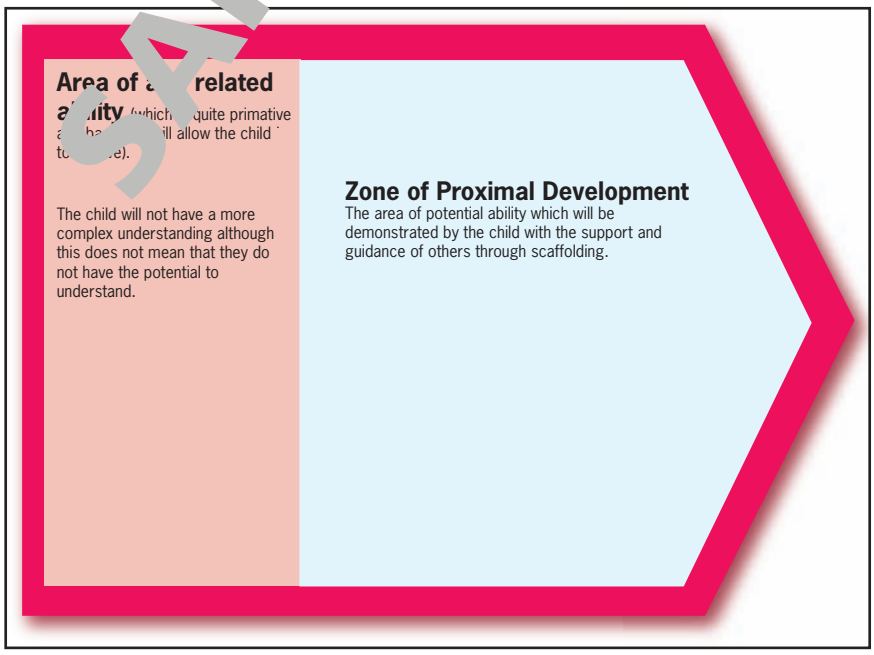


Figure 3.9 The area of overall ability that is made up of age-related ability plus the zone of proximal development; the zone will vary according to the ability of the child, with 'brighter' children having larger zones

Once the child has received the advice and guidance from the adult, they will internalise the knowledge with practice. Take, for example, a child who is given a box of bricks. The child will play with the bricks, may lay them out or sort them for colour. They may find that, by putting one on top of the other, they can make a tower. However, if an adult or older child is there with them and shows them how to make a tower, they are likely to copy and learn the properties of the bricks more quickly. This example illustrates how the scaffolding provided by social interaction with the adult will give the child the chance to achieve more.

We have already identified how important social relationships are in other areas of children's development when we looked at attachment relationships in the earlier part of this chapter. Vygotsky, through his theory, highlights the importance of social relationships in learning. Because his theory focuses far more on the *opportunities* a child has to learn and experience, it is not age related in the same way as Piaget's. Although he believes that children do go through developmental stages in a uniform order, Vygotsky is more flexible in the way that he looks at development.

INTRODUCTION TO THE CORE STUDY

Piaget's book, *The Child's Conception of Number* (1952), which was first published in Switzerland in 1941 as *La Genèse du Nombre chez l'Enfant*, contains ten chapters that look at different aspects of the way children learn about numbers, and how their developmental stage dictates their understanding. The majority of children who were involved in the studies that make up this book were all in the pre-operational stage of development (aged between four and eight years).

The core study covered here is found in Chapter 4 of Piaget's book, however, to put the study in context, we are going to consider Chapter 3 and the beginning of Chapter 4.

Chapters 1 and 2 consider the child's ability to conserve quantity, and Piaget investigates this using methods such as the conservation of liquid experiment (outlined earlier in this chapter, page XX). From these studies he identified different stages of conservation ability.

Chapter 3

Piaget begins Chapter 3 by explaining that correspondence means 'looking at the relationship between two quantities'. This can either be done by comparing their size (e.g. length) or by making what he describes as a 'one–one' correspondence between the elements, that is, by saying whether two sets of objects are equal in number. Sometimes it is quite difficult to compare two sets of objects because they may look very different due to the way they are set out. (See Figure 3.10, which might make this easier to understand although it is not included in Piaget's book.)

- Piaget suggests that the correspondence may not be made because we perceive the sets as being very different.
- On the other hand, the correspondence may occur because the two sets look as if they are the same, but we would still need to count them to make sure.

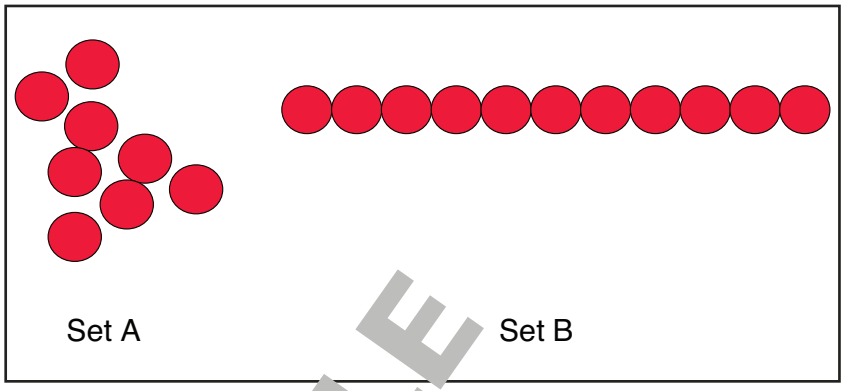


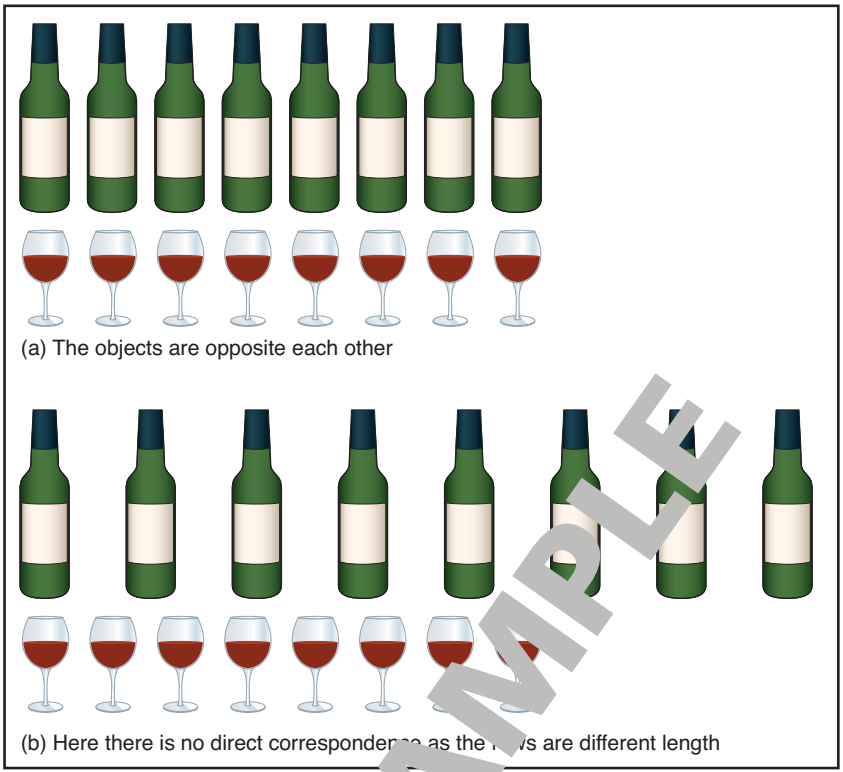
Figure 3.10 This diagram illustrates how you may need to check whether there really are the same number of circles in Set A and Set B (even though you might have already been told there are ten circles in each set)

- Piaget continues by saying that his intention is to look at the development of correspondence. He says it is important to look at two different situations where a child might discover or make a one–one correspondence.

1. The child will have to assess the value of a set of objects by comparing them with objects of the same kind. Piaget uses the example of two children playing marbles, where one child places four marbles on the ground and the other child puts down his marbles opposite the previous child's marbles. Here the child has identified an equivalent set without having to count (Piaget calls this spontaneous correspondence).
2. The second situation is where a child has to identify corresponding items that are different but complementary. Piaget investigates this ability using complementary items such as glasses and bottles, flowers and vases, and eggs and egg cups. He found that children are able to make the correspondence when the objects are opposite each other (Figure 3.11a), but if the rows are not equal in length, even if the same numbers are present (Figure 3.11b) they find it really hard to see that the numbers are the same (equivalent to each other).

Piaget's conclusions are that there are different types of correspondence, which start with intuition and are based on appearance. The final stage, which Piaget calls 'quantifying correspondence', includes children who can 'conserve' the knowledge that two sets remain the same even after they no longer appear to

correspond. He describes this as 'necessary, lasting equivalence' (1952, p. 65).


(a) The objects are opposite each other

(b) Here there is no direct correspondence as the rows are different length

Figure 3.11 Piaget's test of correspondence ability

Chapter 4: Spontaneous correspondence

Piaget continues to discuss correspondence in the beginning of Chapter 4 by looking at how it develops spontaneously in children (i.e. it is not taught). By this he meant that we should consider situations where a child has to instinctively estimate the correspondence on his* own and then use it in the best way he can. Piaget wanted to know if children would spontaneously use one–one correspondence as a way of choosing the same number of elements that they have seen in an array of elements. By this he meant he would show them, for example, some buttons set out in a pattern and ask them to pick the same number of buttons from a box,.

* Piaget generally used the male pronoun when talking about children, although he meant both boys and girls. We have followed the same protocol.

If a child instinctively estimates, it means that he is using the appearance of the objects to estimate quantity, rather than actually counting them, which is what we, as adults, often do when we judge

from 'a show of hands' as to whether people are in favour of something or not.)

Piaget uses two techniques for his research into the spontaneous development of correspondence – reproduction of figures and then single rows (the core study). We are going to look very briefly at the reproduction of figures and then we will focus on the work he undertook using single rows of counters.

Chapter 4 part 1: Reproduction of figures

Piaget showed children a series of figures (patterns) that were made with elements such as counters, sweets or pennies. Table 3.10 shows the different types of figures used in this section of Piaget's research. He asked the child to take the same number of elements out of a box as there were in each figure. He wondered how they would do this and gave them no directions. In each case, the children were presented with a box containing the same elements as the model, not complementary items like bottles and glasses.

Piaget explained that the results of these tests allowed him to identify three stages of development, as follows.

- Stage 1 – Global comparison: here the child uses only global comparison. This means they imitate the model without trying to look at the number of counters used. For example, the child might make a row that is the same length as the model but the counters might be of a different density – so there may have been more or fewer counters than in the original row. With closed figures, children at this stage can reproduce figures that require a definite number of counters if the shape is familiar (Category 4) but if the shape is unfamiliar (Category 5) or does not involve a definite number of configurations (Categories 1–3), the copy will not be numerically correct.
- Stage 2 – Intuitive correspondence: in this stage, children are more able to copy the models accurately and are often correct in their one–one correspondence. They will take the counters out, one by one, to reproduce the model. However, Piaget notes that the children's estimates are still very much based on perception rather than numerical correspondence. He explains that this can be demonstrated by altering the shape of the model figure after the child has finished, which will result in the child no longer thinking that their model is made up of the same number as the changed model.
- Stage 3 – Operational correspondence: in the final stage, the child will be able to choose the right number of items and will be able to retain that information despite changes in the appearance of the model. They will be able to conserve number.

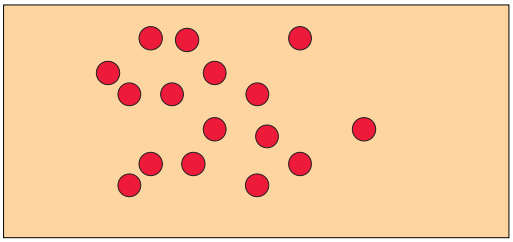
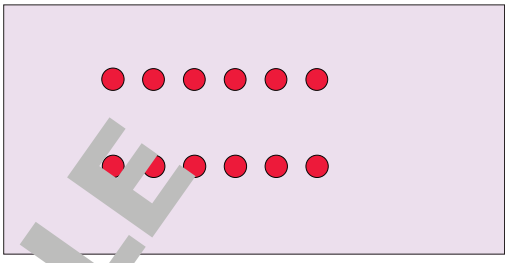
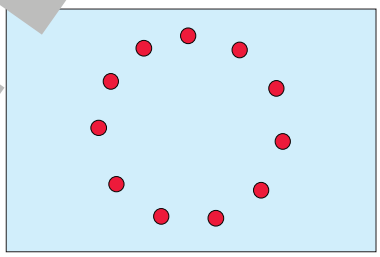
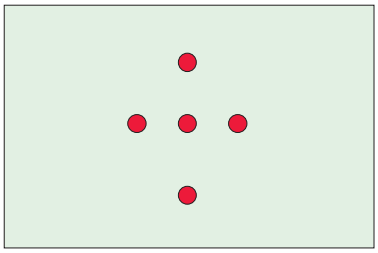
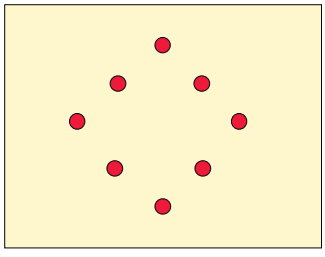
Figure type	Appearance
Category 1 Badly structured (randomly distributed counters that were not touching or overlapping)	
Category 2 Open series (two parallel rows of counters)	
Category 3 Closed figures (the shape did not depend on the number of counters used but th figure could have been a circle or a house or a right angle)	
Category 4 Closed figures of which t sh e depended on the numbe co nters (a circle or a cross)	
Category 5 More complex closed figures, less familiar to the child (a rhombus, which is more commonly known as a diamond shape)	

Table 3.10 The five different types of figures used in this section of Piaget's research

CORE STUDY: Piaget (1952)

Note

A selection of the conversations Piaget had with the children are contained in text boxes and are direct quotes from his book. The actions contained in the text boxes are sometimes simplified and sometimes direct quotes.

Piaget, J. (1952) The Child's Conception of Number. *London: Routledge.*

Candidates should be able to:

- describe Piaget's experiment into the conservation of number
- outline the limitations of Piaget's study.

Chapter 4 part 2 – Single rows

Piaget decided that he wanted to find out whether the same three stages could be identified when single rows of items were used rather than more complex figures (as outlines above). He explained that he felt it was important to make the task as simple as possible for the children.

Method

Piaget (or one of his colleagues) showed the child a row of items, such as counters, sweets or pennies. He would then ask the child a question which required them to produce a row that was the same as the model. *(We do not know whether the procedure was conducted by Piaget himself, but for the purpose of this text, we have assumed that it was conducted by Piaget.)*

Aim

The aim of this part of the study is to help understand the developmental processes children go through when trying to make two sets of equal value, and to use this understanding to provide a theory of how children develop the concept of number.

Participants

17 children, aged between four years one month and six years two months. We know nothing more about Piaget's sample, selection process, etc.

Stage 1 – Global comparison

Piaget said that the children's responses in this stage were very similar to the responses in earlier trials. In this stage, children made their comparisons on either the length of the row or the density of the row (without coordinating the items on a one–one basis).

Examples of length: Don

A good example of this is the case of Don (four years one month) who was shown a row of seven pennies.

Piaget: Mummy is giving Myriam all those pennies to go to the fair. Now you take the same number of pennies as Myriam.

[Don took a handful of five pennies at random but put them on the table so his row was longer than the model.]

Don: It's bigger, it's not right.

Piaget: Why? Is one of you richer, or have you both got the same?

Don: Yes, I'm richer.

Piaget: Well then, make it so that it's right.

[Don then put them all back into the box and took out four, which he put close together, then one more, which he put close to the others.]

Don: [referring to his row] But this will be smaller, I'll have to put some more.

[Don then added one at each end, giving himself a row of seven, which was the same length as the model.]

Piaget: Are they the same like that, or will one of you be richer?

Don: They're exactly the same.

Examples of length: Boq

Boq (four years seven months) was given a row of six sweets.

Piaget: Put as many sweets here as there are there. Those (six) are for Roger. You are to take as many as he has.

[Boq made a compact row of about ten, which was shorter than the model.]

Piaget: Are they the same?

Boq: Not yet. [adding some]

Piaget: And now?

Boq: Yes.

Piaget: Why?

Boq: Because they're like that.

[Indicating the length. At this point the six in the model were still spread out.]

Piaget: Who has more?

Boq: Roger.

Piaget: Why?

Boq: Because they go right up to there.

Piaget: What can we do to make them the same?

Boq: Put some more. [Boq added one more.]

[Piaget then closed the six up closely together and Boq's were spread out.]

Boq: I've got more.

[Boq was then shown two rows of sweets, one row had three sweets spaced out and the other had four sweets that were close together.]

Piaget: Where are there more?

Boq: There. [Pointing to the line of three sweets.]

Piaget: Why?

Boq: It's a bigger line.

Examples of length: Ler

Ler (five years three months) was shown a row of s[illegible]nnies.

[Ler put eight pennies closer together opposite the row of six pennies. Piaget spread the six pennies further apart. Ler said he thought the[illegible]e now more than eight.]

Piaget: Why?

Ler: Because it's bigger here.

Examples of density: Don

Don (four years one month) followed[illegible] procedure as Ler (above). Then he was shown a row of six blue counters, which[illegible] was told belonged to Myriam.

[Don put seven red counters tog[illegible]der six blue ones.]

Piaget: Are they the same?

Don: Yes.

[Piaget then closed up the row of six blue counters to make them closer together, and spaced out his row of seven blue counters.]

Piaget: And now?

Don: I've got more because it's bigger. No Myriam's got more.

Piaget: Why?

Don: Because they're closer together; there are a lot.

Conclusion

The three elements that children *could* use to identify correspondence were:

1. the number of items

2. the density of items in the row

3. the length of the row.

The only one that is accurate is the first, but not one child in this category focused on the number of items. The only way they could identify correspondence at this stage was if the rows were equal in length and density. Piaget's conclusion was that, from these trials, the children were basing their estimations on their perceptions rather than on the number of elements present.

- He cites the case of Boq and explains that Boq is ignoring the number of sweets and also the distance between each one (density), and is simply focusing on length.
- Don, on the other hand, is using the criterion of density and ignoring the length of the row.

Piaget says that children initially look at length, then they notice density and this sometimes causes confusion. It is only when they can look at both length and density simultaneously that they are able to make a one-to-one correspondence.

Stage 2: Intuitive correspondence, without existing equivalence

In this stage, children were asked to pick out the same number of objects as there were in a model row of six. According to Piaget, they would 'make an optical spatial correspondence' with the model, which means they would focus more on the density of the row and try to match that. They will no longer accept that there are the same number in two rows if they look dissimilar.

Example: Pret (four years 11 months)

Pret succeeded in making the correct correspondence after first putting one more into his row. Then the items in the model (Piaget does not specify what they were) were closed up.

Pret: There are more there because there's a bigger line. It has to be the same line, then they're the same.

Piaget: What must we do then?

[Pret rearranged the items so that the rows were the same length.]

Here Pret has focused on length and density. He identified the density initially, then adjusted the length.

Example: Hab

Hab (five years three months) was shown a row of six sweets.

Hab began by putting nine sweets opposite the six in the model, but made the rows the same length.

Hab: That's it.

Piaget: Are they the same?

Hab: I'm not sure.

Piaget: Where are there more?

Hab: There. [Pointing to the row of nine close together.]

Piaget: What must we do then?

[Hab put six opposite the six of the model and removed the rest. Piaget then pushed the six sweets in the model closer together.]

Piaget: Are they the same?

Hab: No.

Piaget: Are there as many here [pointing to the model] as there [pointing to Hab's row]?

Hab: No, there [pointing to her model] there are more.

Piaget: Is there more to eat on one side than the other, or are they both the same?

Hab: I shall have more to eat.

Piaget: Make them both the same then.

[Hab removed two then made the one–one correspondence and finally put the two back when she found there weren't enough to make one correspondence!]

Here Hab begins like children in the first stage and puts too many sweets under the model. By spacing out her sweets (to maintain physical equivalence) she can make the correspondence, but the only way she can be sure there is still correspondence is to keep copying the model with her own sweets. She is not 'conserving' her knowledge of the numbers of sweets.

Conclusion

Piaget explains that children in this stage are now able to make a copy that is the same length and density as the model. In the first stage, when the length was changed by Piaget, the child added items to increase the length of their row. In this second stage, they were able to either push the items together or space them further apart so that the rows looked the same. They were still unable at this stage to judge correspondence without adjusting the length of the line.

If the two rows are now spaced out equally and have the same number of items, when one is changed, the child can no longer see the correspondence without adjusting the items back so they are, in effect, opposite each other. At this point, they have lost their ability to see the relationship between the length and the density (until they reinstate the objects). They were *unable* to conserve (remember) their knowledge without having a physical representation in front of them.

Piaget explains that one thing the children need to grasp at this point is the idea of reversibility – that is, if items are spread out, they can also be pushed together but still retain the same quantity. The only way they are able to do it in the second stage is to

physically manipulate the items, whereas when they are able to conserve, they will be able to retain and use this information without needing to resort to using apparatus.

Stage 3: Operational correspondence and lasting equivalence (being able to conserve)

In this stage, the children were able to assess correspondence without having to worry about the appearance of the rows. They expressed numerical quantities instead of looking at appearance.

Example: Fet

Fet (five years five months) was shown a row of six pennies and told they belong to another boy.

Piaget: Take the same number of pennies as there are there.

[Fet made a row of six under the model but put h[illegible] much closer together so that there was no spatial correspondence between the rows.]

Piaget: Have you got the same number?

Fet: Yes.

Piaget: Are you and that boy just as ric[illegible] as [illegible] another?

Fet: Yes.

[Piaget then closed the gaps betw[illegible] pennies of the model, making the row shorter. He opened the gaps in Fet's row, ma[illegible] it longer.]
Piaget: And now?

Fet: The same.

Piaget: Exactly?

Fet: Yes.

Piaget: Why are they the same?

Fet: Because you've put them closer together.

Example: Lan

Lan (six years two months) was shown a row of six matches.

[Lan picked up four without counting, but while looking at the model. He put his finger on the fourth match of the model and then took two more matches out of the box. He put his six matches in a pile in front of the model row.

Piaget then spread his matches out in a row and made the matches in the model into a pile.]

Piaget: Are they the same?

Lan: Of course.

Piaget: Why?

Lan: Because before, those [pointing to his own matches] were in a bundle and now you've put them like that [spread out], and these [the model] were spread out before, and now you've made them into a bundle.

In this last stage the children were able to produce one–one correspondence with ease and did not bother to copy the model. Therefore none of these children is relying on the items being laid out facing each other. For example, Fet spread his counters out so they were more compact than the model but still made the correspondence. Similarly, Lan put his matches in a heap.

Piaget states, 'It is this freeing from perception that marks the beginning of operations properly so called, which are thus seen to be the result of the progressive reversibility of thought' (1952, p. 84).

This third stage shows the completion of the child's understanding of how length and density are related, even when the display is changed. With this understanding of reversibility comes the ability to conserve number.

Overall conclusion

Piaget concludes that the facts presented in this chapter provide a picture of the stages children pass through when they begin to understand correspondence, and this provides a picture of the development of the concept of quantification.

Piaget asks the following questions.

Q1: Why don't children look at all aspects of a problem at the beginning (or, as Piaget states, 'decompose the global totalities')?

He suggests that either children do not feel that they have to break problems down at the beginning or they do not have the ability. The results have indicated that they do not have the ability.

Q2: How does the first form of decomposition or intuition start?

According to Piaget, the child goes through the following phases.

- Global evaluation (general appearance), which Piaget calls 'gross quantity'. Here the child initially just sees items but cannot actually analyse the relationship between them.
- Qualitative correspondence (where they see one aspect only of the array), called 'intensive quantity'. Then they begin to see the relationships between the items, but can see only one relationship at a time.
- Numerical correspondence (understanding the concept of number), called 'extensive quantity'. Finally, they are able to look at the relationships at the same time, realise they are reversible and that the numbers do not change despite the reversibility.

Limitations of Piaget's study

When evaluating this core study, we can consider some of the more general limitations of Piaget's work that we mentioned earlier in this chapter (see page XX).

Standardisation

According to the cover of his book, *The Child's Conception of Number*, from which the core study comes, the research is based on 'a set of investigations carried out over a number of years with a team of co-workers'. We cannot be sure that the techniques used were standardised across all trials. For example, did all the co-workers have the same sorts of relationships with the children, did they influence them in the same way, use the same techniques, and so on.

Sample and selection of participants

There is no information in the book about the number of children studied, where they came from, their level of ability or language development and so on. The core study itself cites examples from 17 children aged between four years one month and six years two months. We do know from other studies that most of his research, conducted in Switzerland, focused on white middle-class children of professionals, who were not representative of the population in general.

We may question how motivated or how compliant the children were to respond to Piaget. We cannot be sure as to whether Piaget interviewed other children but excluded their data as they went against what he was trying to illustrate.

Procedure

We are not given precise information about who conducted the interviews (although for the purposes of this book they are all attributed to Piaget). The procedure was not standardised. Piaget (or a colleague) asked children questions, and tailored the questions to suit each child's responses.

Language

Children of different ages have differing abilities to understand instructions. However, the instructions and directions were similar for all children and we must question whether they really understood what they were being asked.

Piaget also used the same questions on more than one occasion with a child (Jon and Hab), and on other occasions he used similar questions. This may have been confusing and resulted in the children rethinking their original answer and answering differently.

Results

One criticism of Piaget's theory is that the children may have been more able than Piaget suggested. In this study, one child, Boq, looked at the model of six sweets spread out on the table. When told to take as many sweets as Roger, he took ten and spread them out under Roger's row on the table, pushing his row closer together.

When asked if they were the same, he replied 'Not yet' and took some more. He may have been hoping the researcher would not notice and he would get away with a bigger number than Roger! When asked again if they were the same, he replied 'Yes' because the rows were the same length. The row of six was then spread out and he added another one. When his row was spread, he finally agreed he had more, but perhaps at this point he realised he was not going to get away with it!

Piaget's theory may well be representative of western cultures because scientific thinking and formalised operations (thinking without having to have items to manipulate, such as the counters) are considered to be advanced and are valued by these cultures. On the other hand, different cultures may not have the same value system and therefore the children may not develop these skills at the same rate, or indeed at all. This does not mean that they would find it impossible. A similar argument would be that if you lived in the centre of a land mass, you would not value the ability to swim underwater for long periods of time in the same way as an island population that depended on fishing and shell gathering for their livelihood.

Although Piaget's work has been researched and challenged by numerous psychologists over the years since it was first published, the general ideas have stood the test of time. Piaget got us to focus on the way that children think, and to realise that they don't just think in a simple version of adult thought but have a thinking structure all their own. It is generally accepted today that children develop their thinking and language through a series of measured changes (which we can call stages) and that Piaget largely described these changes in the studies like the one outlined above. His work continues to influence the methods we use to help children learn, and it is difficult to think of many other psychologists who have had such a major effect on the way we see ourselves in the twenty-first century.

APPLICATION OF RESEARCH INTO COGNITIVE DEVELOPMENT: EDUCATING CHILDREN

Candidates should be able to:

- explain how psychological research relates to educating children, e.g. key stages in relation to Piaget's stages, active/discovery learning, scaffolding in relation to Vygotsky's theory.

EDUCATING CHILDREN

In the UK today, education is divided into different key stages. A key stage indicates what a pupil is expected to learn and provides a guide

to the knowledge they are expected to have achieved as they pass into the next key stage. Table 3.11 shows how the **key stages** relate to the different developmental stages as outlined by Piaget. It also shows that education provision in the whole of the UK tends to focus around Piaget's developmental theory.

Age/Stage	Key stage	School year	England	Wales	Northern Ireland	Scotland
Infancy 0–2 years Sensori-motor	Key stage 0		Playgroup (with parent) or private nursery	Playgroup (with parent) or private nursery	Playgroup (with parent) or private nursery	Playgroup (with parent) or private nursery
Early childhood 2–7 years Pre-operational	Key stage 0		Reception (non-compulsory) (4–5)	Nursery/ reception (non-compulsory) (3–5)	Reception (4)	Primary (4/5–11)
	Key stage 1	Year 1 and 2	Infants (5–7)	Infants (5–7)	Infants (5–7)	
Middle childhood 7–12 years Concrete operational	Key stage 2	Years 3 to 6	Junior (7–11)	Junior (7–11)	Junior (7–11)	
Adolescence 12–19 years Formal operational	Key stage 3 (11–14)	Years 7 to 9	Secondary (11–18)	Secondary (11–18)	Secondary (11–18)	Secondary (11–18)
	Key stage 4 (14–16)	Years 10 and 11				

Table 3.11 How Piaget's stages relate to school key stages, school years and education provision in the UK

Focus for each key stage

Piaget's theory of child development outlined a child's ability during each stage. Education has taken his ideas and used them to focus on different techniques of teaching. Table 3.12 maps the key stages on to

Piagetian theory. See if you can identify which key stages use Piaget's belief in the importance of active/discovery learning rather than sitting listening to a teacher instruct.

Age/stage	Key stage	
Infancy 0–2 years Sensori-motor	Key stage 0	During this time the infant spends time with its primary caregiver. If a child attends a private nursery, the nursery will have a high staff-to-pupil ratio so that they can spend time interacting, turn-taking and playing with the child. The environment should be rich, with lots of sensory toys (make noises, move and feel different) in order to help the child develop her/his sensori-motor skills.
Early childhood 2–7 years Pre-operational	Key stage 0	Children can start school between the ages of three and five, depending on where they live. The Early Years Foundation Phase is followed in some parts of the UK and aims to provide more play-based opportunities for young children to learn through exploratory play. The staffing levels are high (one teacher to eight children) and these adults will allow children to initiate activities while they will also provide adult-directed learning.
	Key stage 1	Pupils are supported with concrete 'props' and visual aids whenever possible to help them understand and to give them opportunities for hands-on learning. Because their language skills are still developing, instructions have to be clear and simple. They need lots of opportunities to develop their language and vocabulary. Because they are still egocentric, turn-taking and sharing are important.
Middle childhood 7–12 years Concrete operational	Key stage 2	Teachers should provide short instruction and concrete examples, and offer time for practice. Pupils will need to continue to use concrete props and visual aids, especially when dealing with more complicated or abstract problems (e.g. in maths). Hands-on learning is still very important during the first half of this stage. Towards the end of the stage, pupils start to consider abstract concepts rather than having to revert back to concrete props. Pupils are given the chance to look at properties of materials (for example, water) and learn to understand reversibility (water to ice and back to water). Pupils are no longer egocentric and so collaborative working is frequently used by setting group projects and exploratory learning. Games become more cooperative during this stage and negotiation is encouraged.

Adolescence 12–19 years Formal operational	Key stage 3 (11–14)	During this key stage the adolescent is required to develop their abstract thinking without the need for concrete props. Pupils should be offered open-ended projects where they can explore different solutions to problems. They will learn how symbols relate to abstract concepts, and to think about possibilities, formulating hypotheses and considering alternatives. This means they become more able to evaluate theories and look at alternatives (especially through the teaching of subjects such as GCSE Psychology).
	Key stage 4 (14–16)	

Table 3.12 Each key stage and the way children are taught, mapped on to Piagetian theory

You will probably realise that key stages 1 and 2 focus on active/discovery learning, with teachers allowing their pupils to construct their own knowledge for themselves, whereas key stage 3 focuses more on thinking and reasoning.

Scaffolding in education

Vygotsky indicated the importance of providing 'scaffolding' in order to help children understand the world. Scaffolding can provide the framework for the child to assimilate and accommodate new information. Here is a good example of scaffolding:

> When a task is very new, the child might not be aware of the goal and needs to be shown what to do. Consider for example a 9 months old infant who has never before seen a jack-in-the-box. At first the parent tries to capture the child's attention by working the toy and as the clown emerges, exclaiming 'Pop! What happened?' Gradually the adult redirects interaction towards how to use the jack-in-the-box. When the infant reaches the toy, the adult guides the child's hand in turning the crank and pushing the clown down in the box. As motor, cognitive and language skills improve in the second year, the toddler intentionally tries to turn the crank, looking to the adult or otherwise beckoning for assistance. The child's greater knowledge and communicative competence permit the adult to reduce her physical directiveness. Now the adult can help from a distance by using verbal instructions ('Turn just a little more!') and gestures, such as a rotating hand resembling a turning motion while the toddler tries to make the toy work. (Berk 2001, p. 47)

Here the adult is supporting the child's understanding and learning, first non-verbally and then verbally. This scaffolding framework allows the child to achieve the ultimate goal of working the jack-in-the-box. How much longer would it have taken for the child to work it out for itself?

The teacher would use 'scaffolding' to provide demonstrations, assistance and explanation when providing new information, and

offer feedback to the pupils when necessary. Pupils would also engage in group learning or peer mentoring (working with another pupil who may be more able or older). Pupils should also be taught how to use cultural 'tools' such as computers, books, and graphs as a way of supporting their learning and presentation (Woolfolk 2004). This would allow the pupils to internalise the new information and use it in the future, and to progress at a faster pace than if they were left to their own devices.