Learning Outcome: Evaluate theories of cognitive development *(for example, Piaget and Vygotsky)*.

*Evaluate*: Make an appraisal by weighing up the strengths and limitations of something.

Cognitive developmental Psychology focuses on how cognitive processes change over time.

Jean Piaget’s theory of cognitive development

Jean Piaget researched and wrote on the subject of children’s cognitive development from the 1920’s until the 1980’s. Piaget’s great contribution was his understanding that the ways in which children think are fundamentally different from adults. Piaget contributed three main areas of theory:

* The way in which children acquire knowledge (learn)
* The logical flaws in children’s thinking
* Stages of cognitive development though which children pass

These should NOT be treated separately as they are all closely related.

How children learn

Cognitive development is an **active** process in which we explore the world and **construct** a mental representation of reality based on what we discover. The sophistication of our mental representation of the world increases with age as we explore in a more sophisticated manner, building on our existing understandings to create more advanced mental representations.

**Schemas** are mental structures, each of which contains all the information the individual has relating to one aspect of the world. We have schemas for people, objects, actions and more abstract concepts. Piaget believed that we are born with a few innate schemas (to suck, reach, grab) that enable us to interact with others. When our existing schemas are capable of explaining what we can perceive around us, we are said to be in a state of *equilibrium*. However, when we meet a new situation that cannot be explained by our existing schemas, we experience the unpleasant sensation of *disequilibrium*. We are instinctively driven to gain an understanding of the world and so escape disequilibrium. Piaget called this process of modification **adaptation**. Adaption involves Assimilation and Accommodation.

* **Assimilation**-consolidation of existing knowledge.

For example:

* **Accommodation**-creation of new knowledge and the rejection or adaptation of existing schemas.

For example:

**Operations**:

As well as knowledge of things we will encounter in the world, we also need to understand the rules by which the world operates. Piaget called these rules operations. Piaget suggested that the reason that children think in different ways at different stages of their development is because the operations of which we are capable change with age. Piaget believed that while schemas develop with experience, operations develop as the child’s brain matures (biologically controlled). Very young children do not have operations at all, and are said to be pre-operational. The first operations that appear are *concrete*.

This means that children understand the rules governing something as long as they can see it. Later, rules governing abstract concepts are understood.

Evaluation:

+ Children ARE curious from a very young age giving the theory face validity (it makes sense and fits in with our everyday experience.

+ The concept of the schema as a basic unit of knowledge is widely accepted.

- Piaget’s theory suggests that we are most motivated to learn when we don’t understand something. This is not always the case.

- Piaget underestimated the importance of the role of other people in children’s learning. This is addressed better by Vygotsky.

The logical flaws in children’s thinking

From observations of his own children, Piaget noted that different children of the same age tended to make the same mistakes and he suggested that this was because children of the same age committed the same errors in logic. Piaget went on to conduct experimental studies, initially on his own children but later on large numbers of children at a psychology laboratory. He also interviewed children to try and get an idea of how they were thinking when they committed errors in logic.

Object Permanence

Object permanence refers to the understanding that objects exist permanently even when they are no longer visible.

How did Piaget test infants for object permanence?

What do Piaget’s findings tell us about object permanence?

Outline Baillargeon and DeVos (1991) Disappearing Carrot study.

What do Baillargeon and DeVos’s (1991) findings tell us object permanence?

What criticisms can be made about Piaget’s techniques and theory?

Egocentrism

Egocentrism is the tendency to see the world entirely from our own perspective, and to have great difficulty in seeing the world from the viewpoint of others. Egocentrism declines gradually throughout childhood.

How did Piaget and Inhelder (1956) demonstrate egocentrism in the three-mountain experiment?

What did Hughes’s (1975) Policeman doll experiment tell us about egocentrism?

What criticisms can be made about Piaget’s techniques and theory?

Animism

Piaget (1973) reported that children aged 2-4 typically attributed lifelike characteristics to inanimate objects. They may for example worry about hurting or offending their toys, or indeed punish their toys when they are ‘naughty’. This phenomenon of animism is closely related to egocentrism because it takes place when children judge al objects to have the same feelings and motivations as themselves. By about 4 years Piaget believed that children have a clear understanding of which objects around them are alive or not. More recent studies have shown animistic beliefs in children up to 6 years old.

Conservation

Conservation refers to the understanding that objects remain the same in quantity even when their appearance changes. Piaget (1952) reported that young children had difficulty with conservation tasks.

How did Piaget test children for their understanding of liquid conservation?

How did Piaget test children for their understanding of number conservation?

What did McGarrigle and Donaldson’s (1974) Naughty Teddy study tell us about conservation?

What criticisms can be made about Piaget’s techniques and theory?

Read Li et al’s (1999), study of conservation. What implications do the results of this study suggest about the role of education? (p189 course companion) PDF p18

Formal reasoning

Piaget believed that from about 11 years of age, children became capable of formal reasoning. The term *formal* indicates that children capable of this type of reasoning can focus on the *form* of the argument and not be distracted by its *content*. For example, when a child is presented with the question “All green birds have two heads. I have a green bird called Charlie. How many heads does Charlie have?” They should be able to answer “two” (Smith et al 1998). Children who have not gained formal reasoning may be distracted by the content and say, “but birds don’t have two heads”.

Once children have gained formal reasoning they become capable of scientific reasoning.

Describe Piaget and Inhelder’s (1958) pendulum study.

What does Bradmetz’s (1999) longitudinal study tell us about formal reasoning?

What are the advantages and disadvantages of using longitudinal studies in developmental psychology?

Evaluating Piaget’s techniques:

What was positive about Piaget’s research techniques?

Some researchers argue that Piaget’s studies do not make “human sense” to young children. What is meant by this statement?

Piaget’s basic finding was that the sophistication of children’s reasoning increases with age. Is this supported by later research?

For each of the following, state whether research now suggests that they occur later or earlier than Piaget suggested.

* Object permanence
* Conservation
* Formal reasoning

Stages of development

Based on the types of logical error Piaget identified as typical of children of different ages, he proposed a stage theory of development. Piaget identified four stages of development that each child moves through in sequential order during cognitive development.

For each stage add the age range that Piaget suggested and briefly describe the characteristics of children at that stage (in terms of object permanence, egocentrism, animism, conservation, formal reasoning)

Sensorimotor

Pre-operational

Concrete operational

Formal operational

Evaluating Piaget’s stages

The idea that children become capable of more advanced logic as they get older is uncontroversial. This is the basic idea behind Piaget’s stages. However, the idea that development takes place in distinct stages is controversial. Children may simply learn to tackle more complex logical tasks with more experience and **education and with greater brain maturation**.

Which Piagetian stage of development is most controversial?

Why do some researchers claim that Piaget failed to distinguish between competence and performance?

Many studies have been carried out whereby children have been taught skills that they would not be able to develop according to Piagetian view. Does this suggest that cognitive development is solely driven by innate factors?

Applications of Piagetian theory

Outline how Piaget’s theory can be applied to learning in schools.

Background information on Vygotsky

Vygotsky was born in the Russian empire in what is today Belarus. Although he died from tuberculosis aged 37, his impact on psychology has been immense. He is widely regarded as one of the few genuine pioneers of the cognitive approach.

Vygotsky’s theory of cognitive development

Vygotsky’s main contribution was his focus on the importance of **social interaction, culture and language** in a child’s cognitive development. He believed that it was not possible to describe the process by which children acquire knowledge without taking into account the child’s **social environment** or **culture**.

These are the key concepts of his theory:

* Knowledge develops through **social interaction** and **culture** plays an important role.
* **Language** is crucial to the development of higher mental functions
* Children can achieve a higher level of reasoning when provided with the support (**scaffolding**) of a more knowledgeable other. This is referred to as the **zone of proximal development**.

Which of the statements below correctly describes the Vygotskian or Piagetian child?

makes sense of the world as the result of an innate maturation process that drives cognitive development.

makes sense of the world through shared meaning with others.

The Vygotskian child:

The Piagetian child:

The role of social interaction and culture

Vygotsky divided intellect into:

1. Elementary functions – Children have innate capabilities such as attention, perception, memory and sensation.
2. Higher mental functions – Such as reasoning and problem solving. These develop from elementary functions via the input of culture. **Culture** teaches children ***what*** to think and ***how*** to think. These higher mental functions are seen as ‘tools’ of the culture in which the individual lives. Tools are transmitted to children by older members of the culture in guided learning experiences (such as lessons in school), and include the ability to use language, art and mathematics. Experiences with other people become internalized and form the child’s internal representation of the world. Thus, the way each child sees the world is shared with other members of the child’s culture. This means that people in different cultures will have quite different sets of tools, hence different ways of thinking.

Vygotsky conceptualized young children as apprentices, internalizing the mental tools necessary to thrive in their own culture through social interaction. Learning does not just take place in a formal environment such as school, but occurs within all areas of the child’s life. With friends, siblings and parents. **Social interaction** enables young children to observe adults and older children and to internalize the problem solving skills and mental tools they see.

Brazilian street children with almost no formal schooling show an impressive understanding of mathematical concepts that they have internalized from watching their parents trading (Nunes Carraher, 1991).

How do Vygotsky’s theories link to SCLOA?

Vygotsky’s language development

According to Vygotsky, language developed from social interactions with others and was a very important cultural tool. Vygotsky envisaged language progressing in three stages.

* **Pre-intellectual social speech** (0-3 years) – Thought is not constructed using language and speech is only used to enact social change (e.g. receiving objects from a parent).
* **Egocentric speech** (3-7 years) – Language helps to control the child’s own behavior and is spoken out loud. (e.g. when children play games they often verbalize their actions). This type of speech may also re-surface in adults who are completing a complex task.
* **Inner speech** (7+ years) – The child uses speech silently to develop their thinking and publicly for social communication. This provides the foundation for the development of higher mental abilities.

How did Piaget view language development?

The zone of proximal development

Vygotsky used the term ‘zone of proximal development’ (ZPD) to refer to the idea that young children can achieve a higher level of ability on a task with the aid of a more knowledgeable other (generally an older sibling, parent or teacher) than they can independently. Instruction from an **expert** wakens a whole series of developing functions that can be **extended** under supervision from an expert (usually an adult). These abilities would lie dormant and unused if they were left untutored. This is distinguished from the zone of actual development, which refers to a child’s independent ability on a task. Vygotsky (1984) illustrated this with an example of two 8 year old boys who can complete the same task in terms of their actual level of development. However, in collaboration with an adult, one can solve problems at a 9 year old level, while the other performs at a 12 year old level. Effectively the boys differed in the breadth of their ZPD.

What does Vygotsky’s theory suggest is the limiting factor in what a child can learn at any time?

What does Piaget’s theory suggest is the limiting factor in what a child can learn at any time?

A child can increase in competence if he or she receives assistance to perform a task that is just slightly beyond his or her current ability. This form of sensitive and appropriate help is called **scaffolding** (although Vygotsky did not use this term). Successful scaffolding can change the child’s level of performance on a particular task. It implies that the adult must be sensitive to the child’s abilities and signals, because children differ.

Give some examples of scaffolding

What is the main difference between Vygotsky’s and Piaget’s theories? Use the words individual, construction and social in your explanation.

What are the main similarities between Vygotsky’s and Piaget’s theories?

What advice would you give to parents of young children based on Vygotsky’s theory?

Evidence

Wood and Middleton (1975) introduced the notion of **scaffolding** as development of Vygotsky’s ZPD theory, in which the disorganized and spontaneous thoughts presented by the child are responded to with the more systematic, logical and rational concepts of a more knowledgeable (usually adult) helper.

They carried out an in-depth observation of 12 mothers with their young children aged 4 years old. Each mother was asked to teach her child to assemble a wooden jigsaw so they could carry out the task unaided. The interactions were videoed and analyzed and coded by the researchers.

Wood and Middleton identified five different types of help, which varied in degree. These included:

* General suggestions (‘Now you choose a piece’)
* Specific verbal instructions (‘Find one of the corners’)
* Indicating materials (‘Try this next piece’)
* Preparing for assembly (‘You need to turn that one round, then it will fit’)
* Physical demonstrations (‘The square piece fits in this hole’)

The most successful mothers adjusted the type and level of help they offered to their child, accelerating help (moving up a level) when they were struggling and stepping back when they were succeeding.

Conner et al (1997) argued that the quality of the scaffolding provided by a mother and father could predict the success of the child in the classroom. This can be applied to reading and mathematical problems in early development. Those children who are supported at home will be more confident in the classroom.

Behrend et al (1992) quantified inner speech by observing the amount of whispering and lip movement children engaged in when given a task. They found children who used the greatest amount of inner speech tended to perform better on tasks.

Evaluation

+ Vygotsky makes an important contribution to developmental psychology as he emphasizes the **importance of social interaction** on cognitive development.

+ There is evidence that children develop abilities in certain tasks more quickly with some instruction. Roazzi and Bryant (1998) gave children aged 4 and 5 the task of working out how many sweets there were in a box on a set of weighing scales. In one condition the children worked alone. In another they had the help of an older child who was not allowed to tell them the solution explicitly. In the assisted condition the older children went through the process of giving successively less explicit prompts until the younger children worked out how to perform the task. Most of the children in this condition mastered the task but those working alone did not.

- There is perhaps too much emphasis on the social environment and his outline of social influence is too vague. Had Vygotsky lived longer, he would have had the chance to revise and advance his theories.

- There is lack of empirical support for Vygotsky’s ideas. This can be explained by his emphasis on processes rather than outcomes because processes are harder to test for.

Vygotsky’s and Piaget’s theories are not completely opposed to each other. An integration of both views might be a productive way forward.

Comparison of Piaget & Vygotsky

* Both theorists believed that young children are curious and actively involved in their own learning and the development of new cognitive skills.
* Both theorists acknowledge the role of biological maturation in a child's development.
* Piaget was interested primarily in what children think and believe at each age, whereas Vygotsky was interested in **how** children develop mental skills through internalization and collaboration.
* Vygotsky places more emphasis on culture affecting cognitive development. Piaget argues that cognitive development is a universal process. Vygotsky does not propose a stage theory.
* Vygotsky places more emphasis on social factors contributing to cognitive development. He saw children as apprentices, developing mental skills through contact with more knowledgeable others. Piaget underestimated this. Piaget focused more on “self-initiated discovery.” He viewed the child as a scientist, learning through individual discovery.
* Vygotsky placed more emphasis on the role of language in development. Piaget does not address this. Piaget suggested innate cognitive structures or schemas as the cause of development.