

CHAPTER

2 Cognitive Development

LEARNING OUTCOMES

After studying this chapter, you should be able to:

1. Describe what is meant by development from the psychological perspective;
2. Describe the concepts in Piaget's and Vygotsky's theory of cognitive development;
3. Apply the principles of Piaget's and Vygotsky's theory to the teaching;
4. Explain the language development from infancy to adolescence; and
5. Identify the biological and environmental influences on language.

INTRODUCTION

‘Development’ is one of the familiar concepts that synonyms with the element of ‘change’. Development involves movement from one state to another. As a result, an interest in development leads one to a concern for transitions. These changes are also understood to have a permanent or lasting impact, or at least having some degree of ‘carry-forward’.



According to Papalia, Olds and Feldman;

“The term **development** refers to the process of **change** and **stability** that occur throughout the human life span.”

(Papalia, Olds & Feldman, 2007).

Changes and stability according to Papalia, Olds and Feldman occur in 3 related dimensions. The 3 related dimensions are **physical**, **psychosocial**, and **cognitive** as explained in figure 2.1.



Physical development includes the growth of the body and brain, sensory capacity, motor skills, and health.

Psychosocial development refers to the changes and stability in emotions, personality, and social relationship.



Cognitive development refer to the changes and stability in mental abilities, such as learning, attention, memory, language, thinking, reasoning, and creativity.

Figure 2.1: Change and stability in human development

As you will learn in this chapter, cognitive developmental theories provide important information about the nature of people’s thought processes and how they are likely to change with age. We begin the discussion with the ideas of 2 prominent cognitive developmental theorists, Jean Piaget and Lev Vygotsky. Next, we will evaluate their main contributions to the classroom teaching and learning. We will also consider some criticisms of their ideas as well. Finally, we will explain the systems of language rules, biological and environmental influences on language and language development from infancy to adolescence.

2.1 PIAGET’S THEORY OF COGNITIVE DEVELOPMENT

Piaget’s theory of cognitive development can be organized into 2 parts. The first part is about the processes children use as they construct their knowledge of the world. The second part is the 4 stages of cognitive development. These stages describe how people’s intelligence change as they grow older.

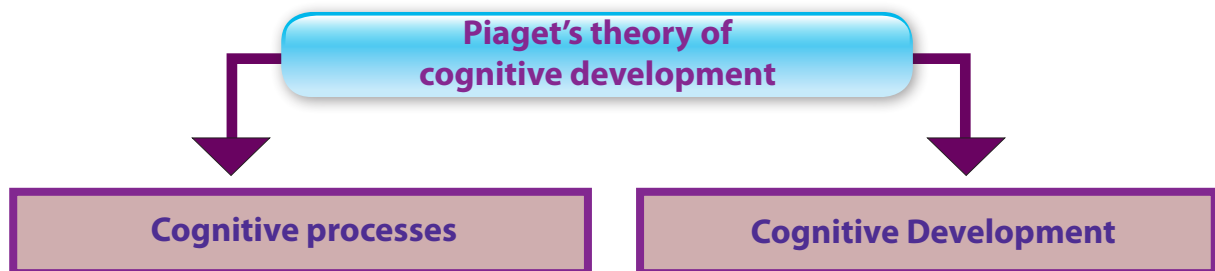


Figure 2.1: 2 Parts of cognitive development in Piaget's theory.

2.1.1 Cognitive Processes

Piaget described cognitive growth as occurring through 3 interrelated processes that are organization, adaptation, and equilibration. Before we explain the processes, let us first look at the concept of scheme as stated below.

Piaget believed that babies begin to understand their world with very simple and innate scheme. **Schemes** are organized patterns of behaviour that a person uses to think about and act in a situation.

Papalia, Olds & Feldman, 2007

In a simpler manner, schemes are actions or mental representations that organized knowledge.

Santrock, 2008

People use these organized patterns of thought and action to understand and interact with their world.

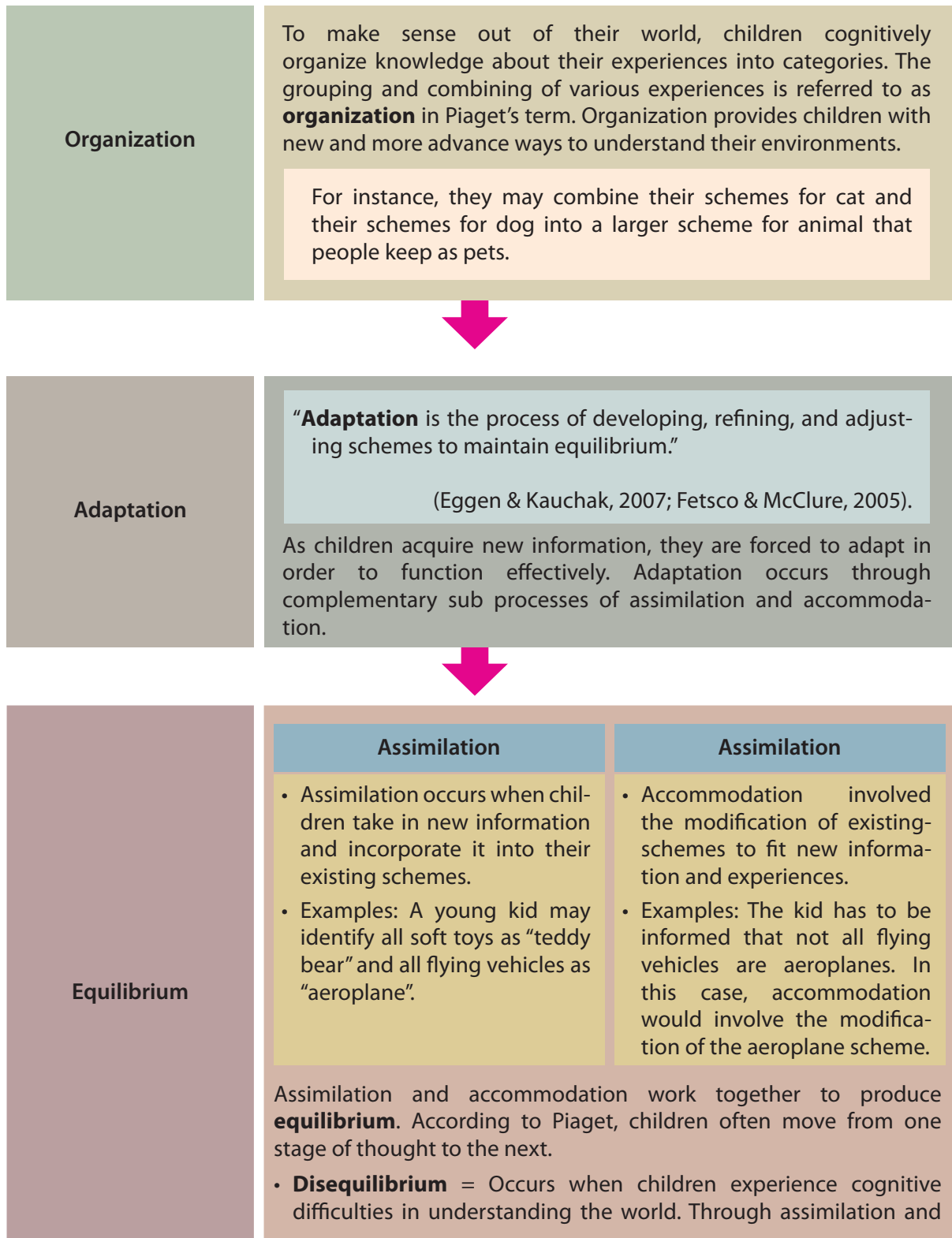
Fetsco & McClure, 2005

Concept of scheme



- Some schemes are present at birth such as sucking and grasping. These physical-based activities are categorized under the **behavioural schemes**.
- As children acquire more information, the schemes become more and more complex. For examples, they have schemes for remembering and solving problems. These are the **mental schemes** or cognitive-based activities.
- Adults have a great number of schemes. For example, they are able to use a computer and understand the idea of globalisation.

As mentioned earlier, Piaget described cognitive growth as occurring through 3 interrelated processes that are organization, adaptation, and equilibration. Let us look at how the 3 process interrelated with each other as explained in figure 2.3.

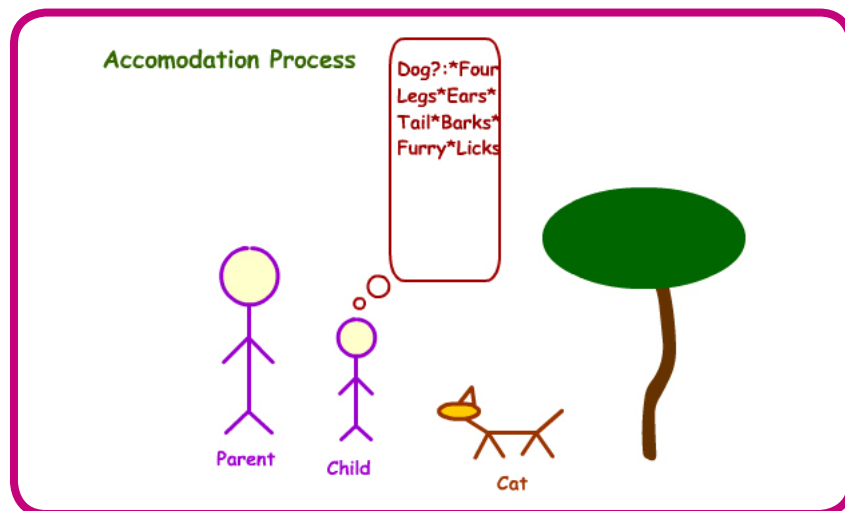
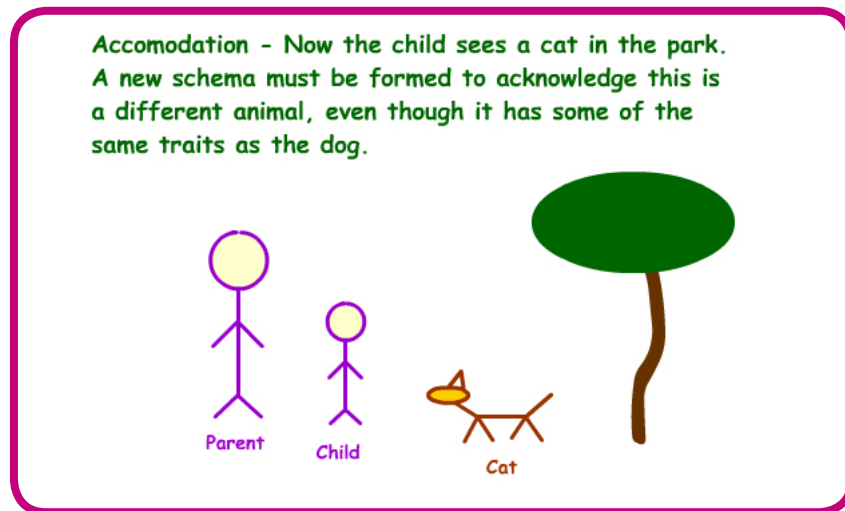


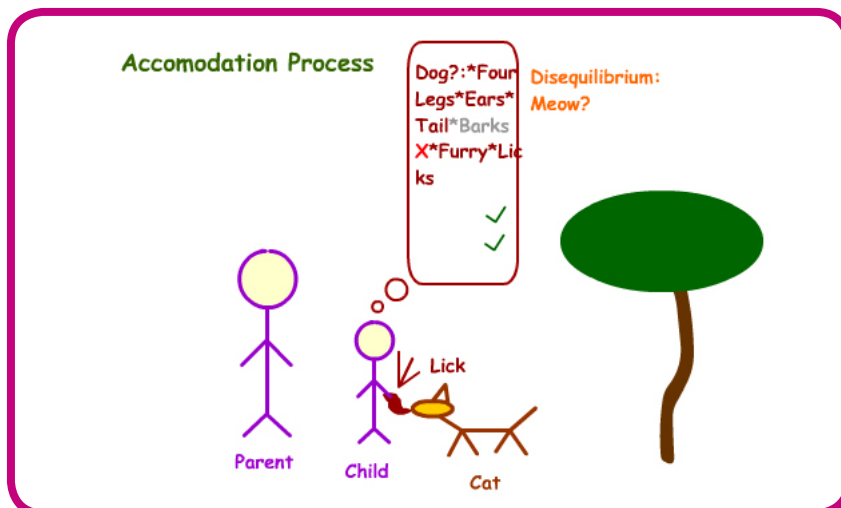
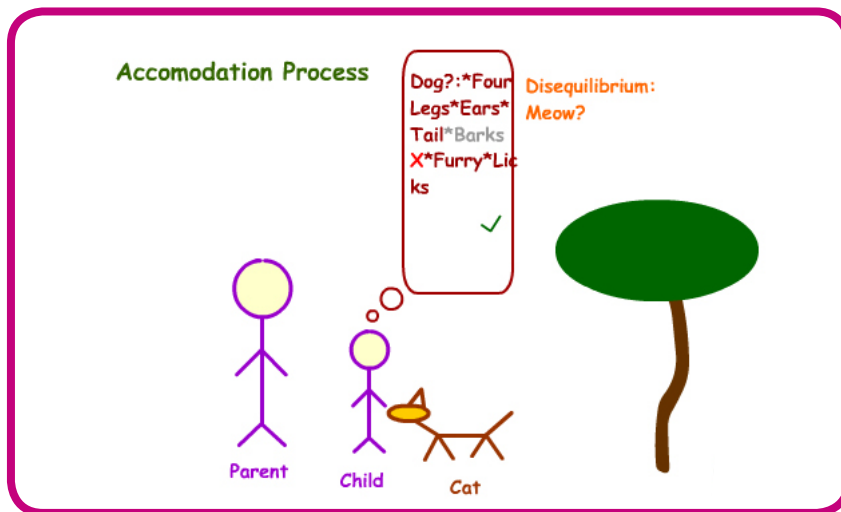
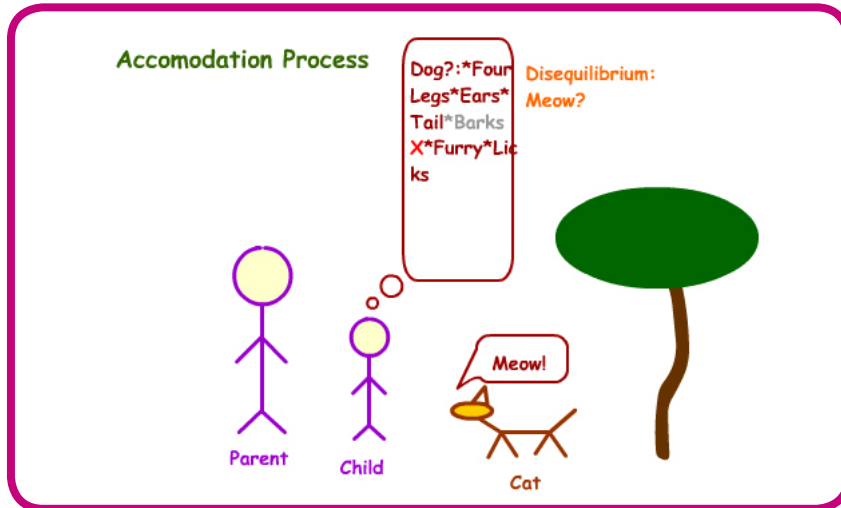
accommodation, children will resolve disequilibrium and reach a balance of thought, or equilibrium.

- **Equilibration** = The movement from equilibrium to disequilibrium and back to equilibrium again. The process of equilibration promotes progression toward increasingly complex thought.

Figure 2.3: 3 interrelated processes in cognitive growth

Let us look at an example below to understand the scheme concept.





Accomodation Process

Dog?:*Four
Legs*Ears*
Tail*Barks
X*Furry*Licks

Disequilibrium:
Meow?Climb?

Parent

Child

Climb

Accomodation Process

The child is in disequilibrium and is actively constructing meaning. He/she asks the parent to assist in resolving this disequilibrium.

Parent

Child

Dog?

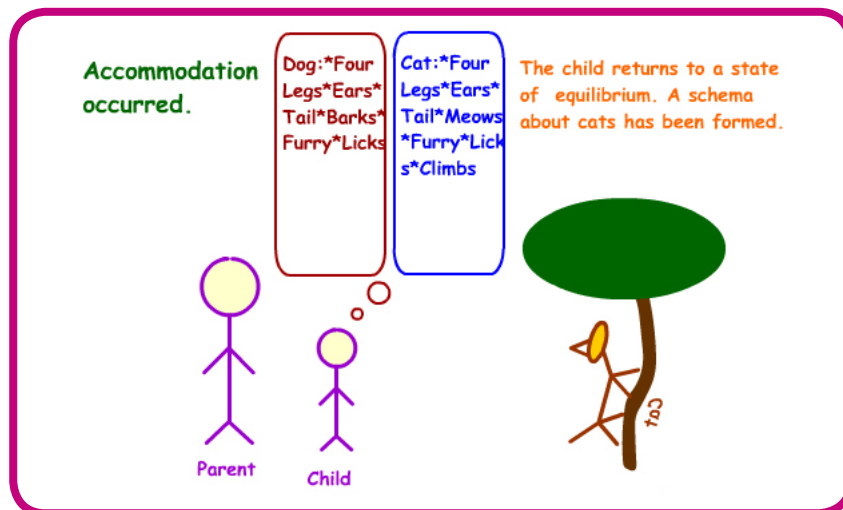
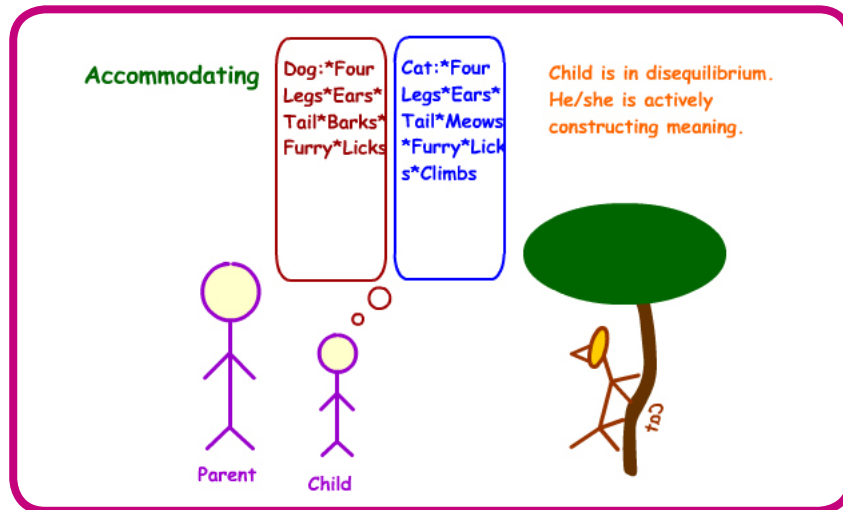
Accomodation Process

Child is in state of disequilibrium. Parent provides feedback & reinforces this is a cat.

Parent

Child

No. Cat.



2.1.2 Piaget's Stages of Cognitive Development

Piaget proposed four stages of cognitive development. There are sensorimotor stage, preoperational stage, concrete operational stage, and formal operational stage as shown on Table 2.1. Piaget believed that all people pass through the stages in exactly the same order. It is important to note that the age ranges associated with the stage may not apply to every child. Some children may reach a particular stage earlier or later than the others.

Table 2.1: Piaget's 4 Stages of Cognitive Development

Stage	Range of age (year)	Main characteristic
Sensorimotor	Birth to 2	The baby constructs an understanding of the world by coordinating sensory experiences with physical actions.

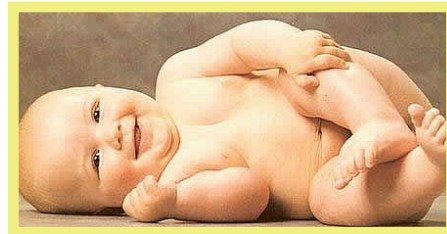
Preoperational	2 to 7	The child begins to represent the world with words and images.
Concrete operation	7 to 12	The child can reason logically about concrete events and classify objects.
Formal operation	12 years to adulthood	The adolescent reason in more abstract and logical ways.

Table 2.1: Piaget's four stages of cognitive development

Sensorimotor stage (birth to 2 years)

During this stage, babies learn about the world through:

- **Sensory activities** such as seeing, hearing, and tasting) and
- **Motor activities** such as moving, reaching, and touching.



In the initial part of the stage, children focus on what they are doing and seeing at the moment. Their schemes are based largely on behaviours and perceptions. For them, objects that are out of sight are out of mind. Later in the stage, babies develop **object permanence**. It is infants' understanding that objects continue to exist even they are out of sight. Toward the end of the stage, babies acquire the ability to represent objects and events in term of symbols. These symbols take the form of words and simple sentences. In addition, they develop the ability to imitate. This ability allows them to learn by observing others.

Preoperational stage (2 to 7 years)



During this stage, the use of symbolic thought expands rapidly especially the use of language. Children's rapidly increasing vocabularies enable them to represent and think about people, objects, events, and feelings. They gain the ability to represent mentally objects that are not present. They also begin to draw people, animals, and objects. In the beginning, their drawings are fanciful. However, toward the end of the stage, their drawings become more realistic, neat, and precise.

Apart from the great expansion in the use of symbolic thought, preoperational children also gain other cognitive advances. For example, at this stage, children begin to realize that

every event has a cause. In addition, they are able to group objects, people, and events into meaningful categories such as big or small and boy or girl. Furthermore, they can count and deal with quantities. As they grow older, they become more able to imagine how others might feel.



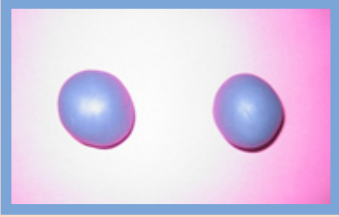
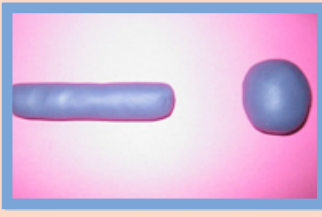
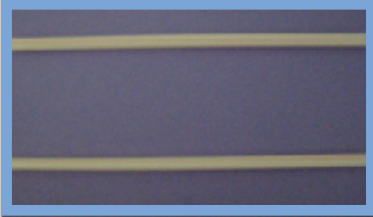
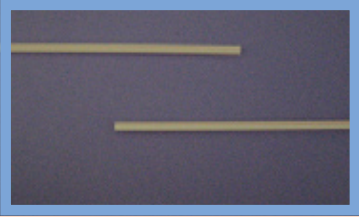


Even though preoperational children make progressive progress in this stage, they have some definite limitations. You can see the limitation in Table 2.2.

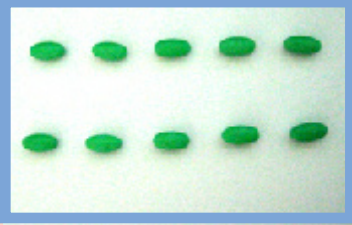
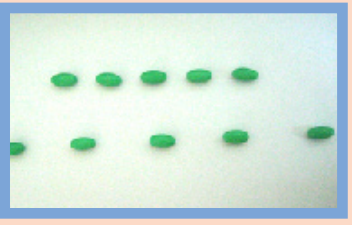
Table 2.2: Limitations of Preoperational Thinking

Limitation	Description and Example
Egocentrism	<ul style="list-style-type: none"> Children of this stage experience egocentrism or the tendency to see the world of others from their own viewpoints. They assume that everyone else share their feelings, reactions, and perspectives. <ul style="list-style-type: none"> Example: A boy assumes that all people enjoy watching Ultraman as he does.
Animism	<ul style="list-style-type: none"> This is the tendency to attribute life to objects that are not alive. <ul style="list-style-type: none"> Example: A child says, "My teddy bear wants a cup of milk too".
Lack of conservation	<ul style="list-style-type: none"> Conservation is the principle that some characteristics of an object stay the same even though the object changes in appearance. <ul style="list-style-type: none"> Example: A preoperational child cannot understand that the amount of liquid stays the same regardless of the container's shape (Refer table 2.3).
Irreversibility	<ul style="list-style-type: none"> Irreversibility refers to the failure to understand that certain processes can be undone or reversed. <ul style="list-style-type: none"> Example: A young child might recognize that $3 + 2 = 5$, but not understand that the reverse $5 - 2 = 3$, is true.

Figure 2.3 shows some types of conservation which explains the principle that some characteristics of an object stay the same even though the object changes in appearance.

Table 2.3: Some Types of Conservation

Type of conservation	Before transformation	After transformation
Shape		
	Preoperational child's response	
	Both straws have the same length.	The sausage shape has more amount of clay.
Length		
	Preoperational child's response	
	The balls have the same amount of clay.	The one on top (or bottom) is longer.
Liquid		
	Preoperational child's response	
	The containers have the same amount of liquid	The tall container has more amount of liquid.

Number		
	Preoperational child's response	
	Both rows have the same number of candies.	The longer row has more number of candies.

As an educator, we should know how to handle with the preoperational students. Figure 2.4 lists some guidelines for working with this types of students.

Guidelines for working with preoperational students

- Use concrete teaching aids such as sticks in teaching addition and subtraction.
- Reduce egocentrism by involving children in social interaction.
- Let students make comparison: big, bigger, biggest.
- Ask them to justify their answers.
- Provide a wide range of experiences such as taking field trips to fire station and lake garden.
- Make short instructions, step by step.

Figure 2.4: Guidelines working with formal preoperational students

Concrete operational stage (7 to 12 years)

During the concrete operational stage, children develop the ability to think in a more logical manner. They are less egocentric than before and can take multiple aspects of a situation into account. At this stage, children can do mentally what they previously could do only physically and they can reverse concrete operations. Table 2.4 summarizes the advances in cognitive abilities of the concrete operational thinkers.



Advance	Description
Spatial thinking	<ul style="list-style-type: none"> • Can use map. • Can give directions for finding objects, places, and locations. • Can estimate distance.
Seriation	<ul style="list-style-type: none"> • Can arrange items in order such as from the smallest to the biggest.
Multiple categorization	<ul style="list-style-type: none"> • Can group items into shape or colour or both. • Understand the concept of class (such as vehicle) and the concept of subclass (car).
Inductive reasoning	<ul style="list-style-type: none"> • Can use inductive reasoning, that is, drawing general conclusion from specific observations.
Conservation	<ul style="list-style-type: none"> • Can comprehend that a transformation in appearance does not imply a transformation in amount.
Reversibility	<ul style="list-style-type: none"> • Can understand that certain processes can be undone or reversed.
Number	<ul style="list-style-type: none"> • Can count in head.

Table 2.4: Advances of concrete operational thinking

Although the concrete operational thinkers make important advances in logical capabilities, their thinking is still limited to real situations in here and now. Put in another way, they have difficulty in understanding abstract ideas. Figure 2.5 lists some guidelines for working with concrete operational students.

Guidelines for working with concrete operational students

- Continue to ask students to justify their answers.
- Encourage students to work in groups and exchange thought.
- Use props and visual aids as well as familiar examples when teaching complex ideas.
- Involve students in adding, subtracting, multiplying, dividing, ordering, seriating, and reversing tasks.
- Create activities that require conservation.

Figure 2.5: Guidelines for working with concrete operational students.

Formal operational stage (12 years to adulthood)

This stage begins when children develop the capacity of thinking that is abstract, systematic, and hypothetical. These capabilities allow students to make abstract reasoning, sophisticated moral judgments, and plan more realistically for the future. They can understand historical time, learn algebra and calculus, imagine possibilities, form and test hypotheses (hypothetical-deductive reasoning in Piaget’s term) and can use deductive reasoning.



Figure 2.6 lists some guidelines for working with formal operational students.

Guidelines for working with formal operational students

- Continue to use teaching aids.
- Give students opportunities to debate and discuss in small groups.
- Develop projects for students to carry out.
- Give students opportunities to solve problem and reason scientifically.

Figure 2.5: Guidelines for working with concrete operational students.

2.1.3 Evaluation of Piaget’s Theory

Piaget contributed a great deal of information about children’s cognitive development. However, his theory has been criticized for some reasons. The following are some contributions and common criticisms of Piaget’s view.

Contribution	<ul style="list-style-type: none"> • Piaget has generally provided us with an accurate account of age-related changes in cognitive development. • His view that individuals can only increase their cognitive performance when cognitive readiness and appropriate environmental stimulation are present affects the nature of educational curricular and teaching methods.
Criticism	<ul style="list-style-type: none"> • Developmental psychologists suggest that cognitive development proceeds in a more continuous fashion than Piaget’s stage theory implies. • Piaget underestimated the age at which children can understand specific concepts and principles. • Piaget’s work failed to take into account the influence of culture on cognitive development.

SELF-CHECK



1. What is a *scheme*?
2. How is accommodation different from assimilation?
3. Describe the major cognitive changes that occur as children move from sensorimotor to formal operational stage.

2.2

VYGOTSKY'S VIEW OF KNOWLEDGE CONSTRUCTION



Lev Semenovich Vygotsky (1896-1934), a Russian psychologist, emphasized the social and cultural processes on human cognitive development. His increasingly influential perspective is popularly known as the **sociocultural** theory or the **sociohistorical** theory.

For Vygotsky, cognitive development occurs as a result of **social interactions**. In social interactions, children work with others to make decisions and solve problems. Therefore, their cognitive abilities increase and eventually they gain the ability to function intellectually on their own.

One of the key ideas proposed by Vygotsky is called the **zone of proximal development (ZPD)**. ZPD is the range of tasks that are too difficult for a child to master alone, but that can be learned with guidance and assistance of adults or more-skilled children as illustrated in figure 2.7. Children in the ZPD for a particular task can almost, but not quite, performed the task on their own.

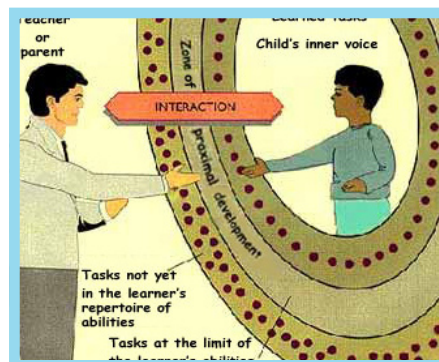


Figure 2.7: Picture that shows zone of proximal development (ZPD) by Vygotsky.

Another important idea to be discussed here is the concept of **scaffolding**. Scaffolding refers to the temporary support that parents, teachers, and more-skilled peers give a child to do a task until the child can do it alone. The concept of scaffolding can be interpreted in the zone of proximal development graph as illustrated in figure 2.8.

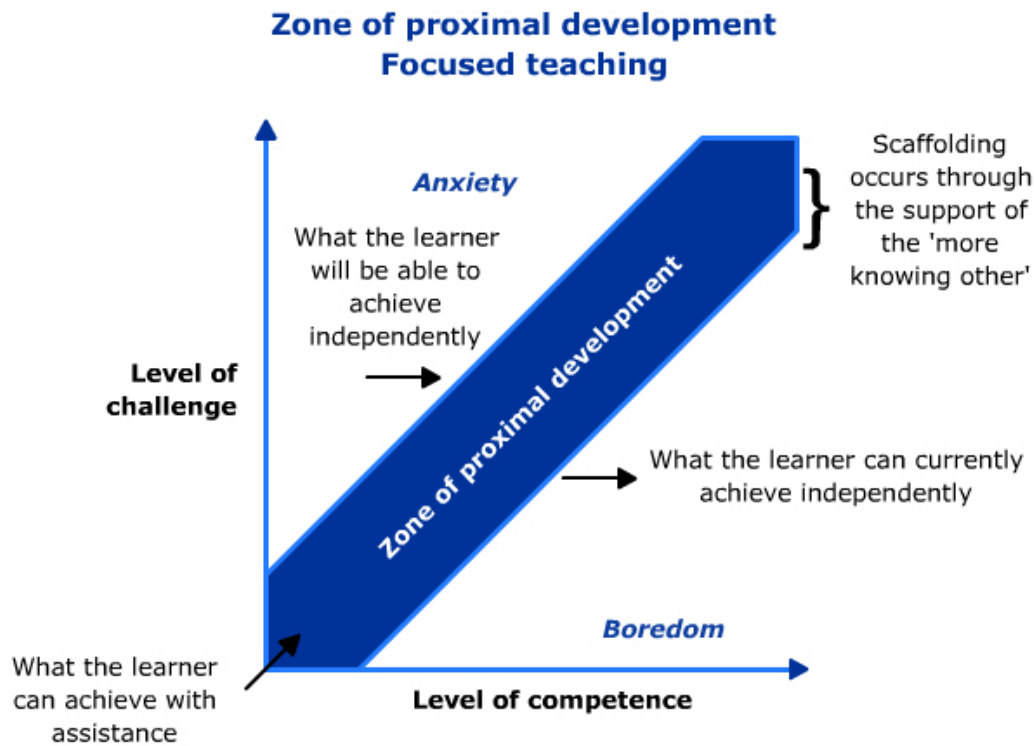


Figure 2.8: Zone of proximal development graph

Demonstrating and asking questions are two ways to scaffold students' learning. An art teacher may demonstrate drawing before asking students to try on their own. Another teacher may ask students such question "Can you provide an example of that?"

2.2.1 Applications of Vygotsky's Theory

- Teach within the ZPD such as presenting tasks that students can perform successfully only with assistance.
- Encourage collaborative problem solving such as working in small groups to accomplish complex tasks.
- Use scaffolding to help student's progress through their ZPD such as providing teaching aids that student can use to make difficult tasks easier.
- Use more-skilled peers as teachers.

2.2.2 Evaluation of Vygotsky's Piaget's Theory

Vygotsky's view fits with the current belief that it is important to evaluate the contextual factors in learning. However, his descriptions of cognitive development were too general. As a result, researchers found it difficult to test, verify, or disprove his theory.



1. What is the nature of Vygotsky's theory?
2. What are the differences between Piaget's and Vygotsky's perspective on cognitive development?



http://thebrain.mcgill.ca/flash/i/i_09/i_09_p/i_09_p_dev/i_09_p_dev.html

2.3 LANGUAGE DEVELOPMENTS

Language can be defined in various ways as stated below.

"Language is one of the most significant cognitive developments of the human species."

Lahey, 2004

"Language is defined as the communication of information through **symbols** arranged according to systematic rules"

(Feldman, 2005)

Language takes several forms of communications that are spoken, written, and signed as illustrated in Figure 2.9.



Figure 2.9: Language takes several forms of communications that are spoken, written, and signed.

Language involves 2 important processes that are, sending and receiving information. To convey information, one must be able to speak or otherwise use words, phrases, and sentences. This ability is referred to as **language production**. **Language comprehension**, on the other hand, is the ability to understand message conveyed by words, phrases, and sentences. To understand how language develops, we first need to review some systems of language rules. Let us look at each of these in turn.

2.3.1 Systems of Language Rules

There are 4 rules of language system. The rules are semantics, syntax, phonology and morphology as shown in Figure 2.10.

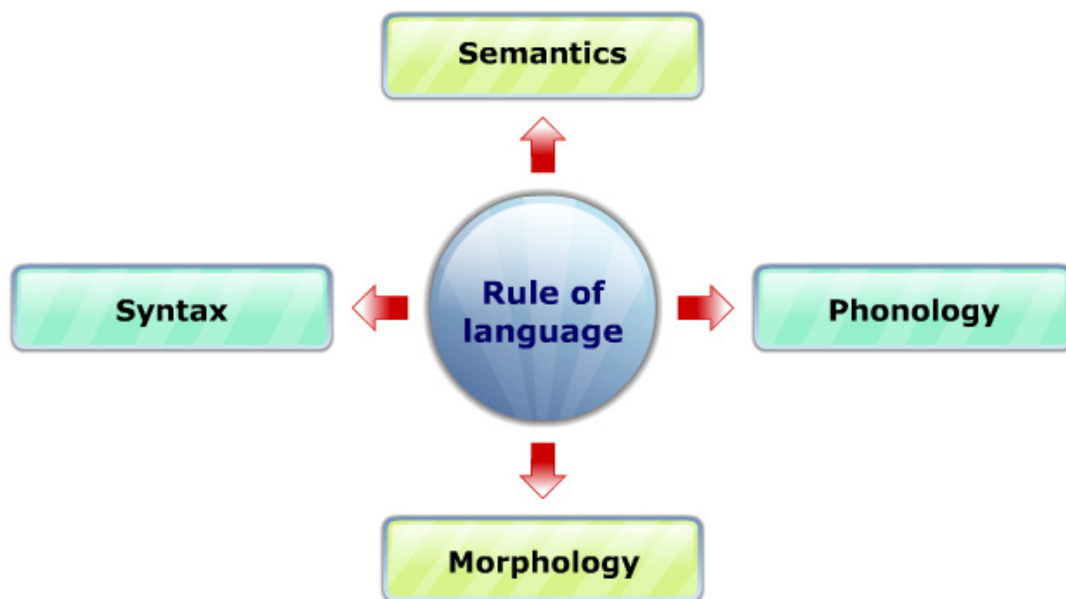


Figure 2.10: Rules for language system

The rules for language system can be describes as below.

(a) Phonology

- Phonology is the sound system of a language.
- English has the sound such as sp, bs, and ar.
- A phoneme is the basic unit in a language. It is the smallest unit of sound that affects meaning.
- Bahasa Melayu has 24 phonemes.

Example:

- The alphabet e sound in **emak** and the e sound in **enak** represent two different phonemes in Bahasa Melayu.

(b) **Morphology**

- Morphology refers to the unit of meaning involved in word formation.
- A **morpheme** is the smallest unit of meaning in a language. It can be a word or a part of a word that cannot be broken into smaller meaningful parts.

Example:

- *Sing, wet,* and *talk* are the examples of single freestanding morphemes.
- The word singer has two morphemes: *sing + er*. Morphemes *-er* means one *who*.
- In Bahasa Melayu, the word *pemakanan* has three morphemes:

pe + makan + an.

(c) **Syntax**

- Syntax is the ways that words must be combined to form acceptable phrases and sentences.
- The syntax of a sentence is determined by a set of rules for combining different categories of words such as nouns, verbs, and adjectives.

Example:

- We understand the sentence "*I am wearing a blue t-shirt*" but the sentence "*Wearing t-shirt I am a blue*" is ambiguous.

(d) **Semantics**

- Semantics refers to the meaning of words or sentences.
- Semantics includes knowing the meaning of such words as dragon fruit and love.

Example:

- The sentence "*He drives a bicycle*" is syntactically correct but semantically incorrect.

Prelinguistic speech

Crying + cooing + babbling, + imitating language sounds

Newborn babies signal needs and feelings through cries and facial expressions. Between six weeks and three months, babies start **cooing**. Then, they begin making speechlike but meaningless sounds. These sounds are called **babbling**. Babies repeat the same sounds such as ba-ba-ba and ma-ma-ma, which are most common across all languages. Language development continues with accidental imitation of language sounds babies hear. They imitate the sounds without understanding the meaning. Crying, cooing, babbling, and imitating language sounds are known as **prelinguistic speech**.



Gestures

Shortly before one year of age, babies start using **gestures** to communicate. For example, they learn that nodding the head means yes or blowing means hot.



Linguistic speech

At about one year of age, babies begin to say **single words**. The productions of single words mark the beginning of the **linguistic speech**. Linguistic speech refers to the verbal expressions that convey meaning. Babies' single words such as go may mean "I want to go out", "I want to sleep" or "Go and get that thing for me". A single words that conveys a complete thought like this is called a **holophrase**.



Telegraphic speech

The babies' first brief sentence comes between 18 and 24 months during which they make telegraphic speech to express various actions. In **telegraphic speech**, words not critical to the message are left out. Examples of telegraphic speech are "Papa work", "Baby cry" and "No watch TV".



Vocabularies increased

During early childhood, children's vocabularies increase rapidly due to **fast mapping** process. Fast mapping allows children aged three to six years old to absorb the meaning of a new word after hearing it once or twice in conversations. In addition, children's grammar and syntax become fairly sophisticated.

Pragmatic

During the school years, children's vocabulary continues to grow. They learn that some words can have more than one meaning. Their understanding of rules of syntax becomes more sophisticated. The major area of linguistic growth during this stage is in **pragmatics** or the practical use of language to communicate. For example, when they recognize a breakdown in communication, they do something to repair it and before introducing a topic with which the other person may not be familiar, they first ask simple questions.



Teenage slang

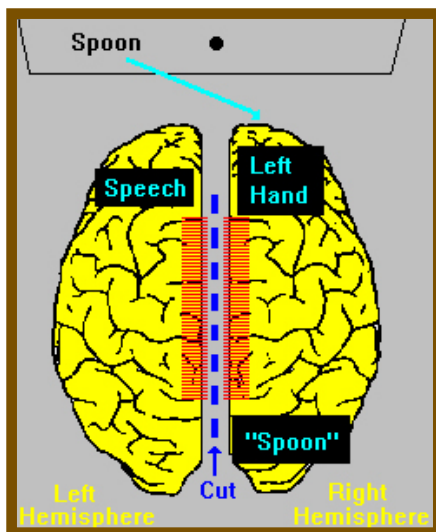
During adolescence, young people know about 80000 words. They can define and discuss such abstractions as love and freedom. They also become more skilled in the ability to understand another person's point of view and level of knowledge and to speak accordingly. Adolescents also like to use **teenage slang**. Thus, they speak different language with peers than with adults.

Figure 2.10: 7 stages of language acquisition

2.3.3

Biological and Environmental Influence on Language

All children acquire language in the same order because there are genetically programmed physiological and neurological features in the brain and vocal apparatus.



Example:

- Research findings indicate that the left hemisphere of the brain play an important role in acquiring and using language, whether spoken or signed.



However, it is widely agreed that the way children learn a particular language depends on the environmental factors as well. Children benefit when parents and teachers actively engage them in conversations, asking them questions, and talk with them. Social interactions like these provide opportunities for children to observe, imitate, and practice language skills. In sum, biology and environment interact to produce language development.



1. How do people use language?
2. How does a child develop language skills?
3. Describe the ways in which early speech differs from adult speech.
4. What influences contribute to linguistics progress?

SUMMARY

- Changes and stability in mental abilities, such as learning and attention are grouped under the cognitive development.
- According to Piaget, cognitive growth occurs through: organization, adaptation, and equilibration processes.
- Schemes are organized patterns of behaviours that a person uses to think about and act in a situation.
- Piaget's four stages of cognitive development are sensorimotor, preoperational, concrete operational, and formal operational.
- For Vygotsky, cognitive development occurs as a result of social interactions.
- The two key concepts of Vygotsky's theory discussed are zone of proximal development and scaffolding.
- Language is defined as the communication of information through symbols arranged according to systematic rules.
- In acquiring a language, children go through the same stages but at different rate.
- Biology and environment interact to produce language development.

KEY TERMS AND CONCEPTS

Terms	Definitions
Accommodation	Piaget's term for modification of existing schemes to fit new information and experiences.
Adaptation	Piaget's term for process of developing, refining, and adjusting schemes to maintain equilibrium.
Animism	Piaget's term for the tendency to attribute life to objects that are not alive.
Assimilation	Piaget's term for process of taking in new information and incorporating it into existing schemes.
Concrete operational	In Piaget's theory, during this stage, children develop the ability to think in a more logical manner.

Conservation	Piaget's term for the principle that some characteristics of an object stay the same even though the objects change in appearance.
Development	Process of change and stability that occur throughout the human life span.
Egocentrism	Piaget's term for the tendency to see the world of others from own viewpoints.
Equilibration	Piaget's term for tendency to seek a stable balance among cognitive elements.
Fast mapping	A process that allows children aged three to six years old to absorb the meaning of a new word after hearing it once or twice in conversations.
Formal operational	In Piaget's theory, during this stage, children develop the capacity of thinking that is abstract, systematic, and hypothetical.
Holophrase	Single words that convey a complete thought.
Hypothetical-deductive	Piaget's term for the ability to form and test hypotheses.
Inductive reasoning	The type of reasoning that moves from specific observations to general conclusion.
Irreversibility	Piaget's term for the failure to understand that certain processes can be undone or reversed
Linguistic speech	Verbal expressions that convey meaning.
Morpheme	The smallest unit of meaning in a language.
Morphology	Unit of meaning involved in word formation.
Object permanence	Piaget's term for infants' understanding that objects continue to exist even they are out of sight.

Phoneme	Basic unit in a language.
Phonology	Sound system of a language.
Pragmatics	Practical use of language to communicate.
Prelinguistic speech	Utterance of sounds that are not words such as crying, cooing, babbling, and imitating language sounds.
Preoperational	In Piaget's theory, during this stage, the use of symbolic thought expands rapidly especially the use of language.
Telegraphic speech	A type of speech in which words that are not critical to the message are left out.
Scaffolding	Temporary support that parents, teachers, and more-skilled peers give a child to do a task until the child can do it alone.
Semantics	Meaning of words or sentences.
Sensorimotor	In Piaget's theory, during this stage, babies learn about the world through senses and motor activities.
Schemes	Piaget's term for organized patterns of behavior that a person uses to think about and act in a situation.
Syntax	Ways that words must be combined to form acceptable phrases and sentences.
Zone of proximal development(ZPD)	Range of tasks that are too difficult for a child to master alone, but that can be learned with guidance and assistance of adults or more-skilled children.

ENDNOTES

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REVIEW AND DISCUSSION QUESTIONS

1. Piaget described a scheme as a psychological structure that _____.
 - A. organizes experiences
 - B. is used in language but not in thought
 - C. we lose as we age
 - D. is only found in those with a set of personal values.
2. Muhammad has a scheme for drawing that had to be changed in order to learn how to paint a picture with a paint brush. This is an example of _____.
 - A. assimilation
 - B. accommodation
 - C. disequilibrium
 - D. reversibility
3. Piaget used the term _____ to describe the process by which new experiences are easily incorporated into existing schemes.
 - A. assimilation
 - B. accommodation
 - C. adaptation
 - D. organization

4. _____ distinguished four major stages of cognitive development.
 - A. Jean Piaget
 - B. Lev Vygotsky
 - C. Sigmund Freud
 - D. John Bowlby

5. The first of Piaget's stage involves _____.
 - A. sensory-motor learning
 - B. operational thinking
 - C. egocentrism
 - D. conservation

6. According to Piaget, the _____ stage is marked by a phenomenal growth in language.
 - A. sensorimotor
 - B. preoperational
 - C. concrete operational
 - D. formal operational

7. Wan Haziq believes that everyone like insects because he likes them. What characteristic of preoperational thought is he demonstrating?
 - A. Egocentrism
 - B. Irreversibility
 - C. Centration
 - D. Assimilation

8. In the television show "Kacang", all sorts of nut were alive, could talk, and had their own personalities. These actions are consistent with the Piagetian concept of _____.
 - A. egocentrism
 - B. animisme
 - C. imitation
 - D. conservation

9. Piaget's stage of formal operations involves _____.
 - A. emotional intelligence
 - B. abstract thinking
 - C. obedience and punishment
 - D. unconscious mental processes

10. Which one of the following is an example of Vygotsky's law of development?
 - A. A student acquires the reading strategies of a more skilled reader by interacting with that more skilled learner.
 - B. Students changes their opinions about an idea based on their own private experiences with that idea.
 - C. Students must represent their knowledge physically before they can represent the same knowledge symbolically.
 - D. Students may have difficulty in complicated problem-solving activities because they are overwhelmed by the complexities.

11. Vygotsky referred to the distance between what a learner can accomplish and what the same learner can accomplish with the help of a more skilled learner as the _____.
 - A. general law of development
 - B. zone of proximal development
 - C. scaffolding
 - D. internalization

12. Before start teaching, Abdul Hadi reminds himself that his students will need a lot of direction at first but will then require much less direction. Abdul Hadi's action provides an excellent example of the concept of _____.
 - A. scaffolding
 - B. fast mapping
 - C. social interactions
 - D. conservation

13. The smallest unit of meaning in a language is known as _____.
 - A. semantics
 - B. syntax
 - C. a morpheme
 - D. a phoneme

14. Which of the following words has exactly one morpheme?
 - A. Cats
 - B. Kitten
 - C. Don't
 - D. Seeing

15. _____ refers to the rules of a language for the ways in which morphemes can be combined in that language.
 - A. Semantics
 - B. Syntax
 - C. Morphemics
 - D. Phonemics

16. A young child said “I rided on the horsey”. His speech reflects his lack of understanding of _____.
 - A. semantics
 - B. syntax
 - C. morphemes
 - D. phonemes

17. Which speech sound is always a vowel-like sound?
 - A. coo
 - B. babble
 - C. phoneme
 - D. morpheme

18. Telegraphic speech involves the use of _____.
 - A. words directly relevant to meaning
 - B. little intonation
 - C. one word utterances
 - D. excessive grammatical morphemes

19. Despite having only heard the word “factor” a few time, Nani can use it in conversation correctly. Nani’s behavior is best explained by _____.
 - A. scaffolding
 - B. fast mapping
 - C. social interactions
 - D. conservation

20. Language is easily learned by humans because the human brain _____.
 - A. is bigger than other brain
 - B. can learn a series of simple words
 - C. has areas that are specialized for language
 - D. processes sound energy at early age