Chapter 6, The First Two Years: Cognitive Development

Chapter Summary

We begin this chapter with Piaget’s framework for observing the intellectual progression over the first two years, from newborns who know nothing about the world to toddlers who can make a wish, say it loud, and blow out their birthday candles. We describe some specific research on early cognition, including a theoretical approach (information processing) and specific methods (habituation, brain scans) that have shown preverbal infants to be avid learners. We end by asking how early cognitive accomplishments, particularly the acquisition of language, occur.

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Sections

A. Section 6.1: Sensorimotor Intelligence

“On Your Own” Activity: Developmental Fact or Myth?

Before students read about cognitive development during the first two years, have them respond to the true-false statements in Handout 1.

The correct answers follow. Class discussion can focus on the origins of any developmental misconceptions that are demonstrated in the students’ incorrect answers.

1. T  6. T
2. F  7. T
3. F  8. T
4. F  9. F
5. F  10. T

Classroom Activity: Design a Study

To underscore the message that developmental psychology is an empirical science, and reinforce students’ understanding of quantitative and qualitative research methods, ask the
class to design a research study that answers questions about development during the first two years. Divide the class into groups of three or four and display or distribute the following question.

*Research Question:* Many people believe that music can have a calming effect on 2-year-olds. What type of study can I conduct to find out if this is true?

Then, give the groups 15 minutes of discussion during which they

1. state a testable research hypothesis,
2. state operational definitions of independent and dependent variables,
3. choose an appropriate research design, and
4. provide a detailed outline of research methods.

Afterward, a spokesperson from each group will share the group’s proposed design with the rest of the class.

*Internet Activity: Cyberspace Hunt: Jean Piaget*

The Internet is an excellent resource for learning about prominent developmental theorists. For example, a website devoted to Piaget contains a wealth of biographical and professional information. Have students search the Internet to find answers to the questions in Handout 2.

*“On Your Own” Activity: Ordering Exercise*

To help students apply their understanding of the stages of sensorimotor intelligence, have them order the events listed in Handout 3. The answers are as follows: a. 5; b. 3; c. 1; d. 4; e. 2; f. 6.

*Classroom Activity: Active Exploration*

If your campus has a child development center, you might arrange a class visit there to highlight the behavior of the “little scientist.” Or, you might make arrangements to bring a child between 12 and 18 months old to class and surround him or her with interesting toys and other objects. As long as the setting is not too intimidating (an observation room with a one-way mirror would be ideal; a small classroom with fewer than a dozen students should be fine), the child will probably experiment and play with many things. You will be able to point out evidence of object permanence, and so forth.

This would also provide an opportunity for students to see social learning in action. Ask the child’s parent to play with a toy in a novel way that promises to capture his or her attention (for example, making a noise with it) and then give it to him or her. Usually the child will repeat the parent’s actions.

*Teaching Tip: Active Exploration for Sensorimotor Learning*
To help students appreciate the degree to which the curiosity of the infant can make life difficult for the parents—especially if the parents do not understand that active exploration is a crucial aspect of sensorimotor learning—you might list, in general terms, several of a toddler’s favorite activities and then give examples of amusing and exasperating instances. If your students have had experience with toddlers, they can add their own examples. Such a list might begin like this.

Toddlers love to make things appear and disappear, so they’re apt to flush toothbrushes down the toilet; turn the TV off and on and off again; drop food from the high chair to the floor; and throw toys out of the playpen.

Toddlers love to put one thing into another, so they stick peas up their noses or into their ears; put bobby pins into electric sockets; stick fingers into your mouth, and unfortunately, almost anything into their own mouths (death by poisoning is more common at age 1 than at any other age).

**Teaching Tip: Assessing Infant Cognitive Development: Three Approaches**

To help students appreciate Piaget’s unique approach to the study of intellectual development, contrast it with two other approaches: the psychometric approach, which attempts to measure cognitive development by using standardized intelligence tests, and the information-processing approach, which attempts to describe the cognitive processes used by children as they develop.

Piaget’s theory of sensorimotor intelligence is primarily concerned with qualitative differences in the way children acquire knowledge. Conversely, psychometric tests, such as the Bayley Scales of Infant Development, represent attempts to quantify intelligence by comparing each child’s capabilities with those shown to be normal for various age norms. The information-processing approach views intelligence not as a single entity but rather as a set of cognitive processes that includes attention, memory, and retrieval.

Further, psychometric tests of infant development tend to emphasize motor rather than verbal skills. The results of such tests generally are not very reliable, nor are they very accurate in predicting the pace or nature of a child’s later cognitive development. Infants’ DQ (developmental quotient) scores on the Bayley Scales, for example, do not correlate significantly with their scores on other standard IQ tests, probably because the latter tests tend to emphasize verbal, rather than motor, capabilities.

The information-processing approach attempts to measure how infants manipulate and process information by monitoring evoked brain potentials, heart rate changes, and eye movements in response to changes in the sensory environment. Many examples of the information-processing approach were provided in the text discussion of perceptual development as part of biosocial and cognitive development. These include research on attention, habituation, and shape preference.

B. **Section 6.2: Information Processing**
To help students understand the sequence and interrelationship of sensorimotor and language development, you might construct a chart of the major events, at first filling in only the age column. When completed, the chart might look like the following. If the class has already studied the material, students should be able to fill in the other two columns themselves.

**Cognitive Development in Infancy**

<table>
<thead>
<tr>
<th>Age</th>
<th>Sensorimotor Stages</th>
<th>Language Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1 month</td>
<td>1. reflexes</td>
<td>reflexive cries</td>
</tr>
<tr>
<td>1–4 months</td>
<td>2. first acquired adaptations</td>
<td>cooing in response to voices and faces; meaningful gestures</td>
</tr>
<tr>
<td>4–8 months</td>
<td>3. making interesting sights last</td>
<td>babbling, especially to people; games that involve turn-taking</td>
</tr>
<tr>
<td>8–12 months</td>
<td>4. new adaptation and anticipation</td>
<td>respond to “no,” “hot,” etc.; imitation of others’ intonation; intent listening</td>
</tr>
<tr>
<td>12–18 months</td>
<td>5. new means through active experimentation</td>
<td>first words (including many words for actions and movable objects); holophrases, especially questions and commands</td>
</tr>
<tr>
<td>18–24 months</td>
<td>6. new means through mental combinations</td>
<td>underextensions; overextensions; start of two-word sentences</td>
</tr>
</tbody>
</table>

Alternatively, you might explain the stages yourself, filling in the columns as you lecture. Either through discussion or lecture, point out the relationship between the development of sensorimotor intelligence and language at each stage. For instance, with the emergence of anticipation, reactions to “no” and “hot” would be expected; once mental combinations are possible, two-word sentences and under- and overextensions are also possible. As will be pointed out in the discussion of cognitive development during early childhood, there is some controversy about whether thought precedes language or language development produces thought. For the moment, however, it is only necessary to point out that the two are related.

**Classroom Activity: Independent and Assisted Learning**

If you are able to arrange it, invite a child and his or her caregiver to class to work on an activity that is just beyond the child’s level of independent performance. One task that works well is counting small objects, such as checkers or small stickers. If your class is large, and you can arrange it, place the objects on a document camera so the class can see as the child counts. If no document camera is available, having the child and caregiver sit at a table in front of the class will also work. First, have the child attempt to count the objects unassisted,
to determine his or her level of independent performance. Next, have the child count the objects again, this time as the caregiver provides scaffolding.

This activity can lead naturally to a comparison of Vygotsky and Piaget. One view is that Piaget viewed children as independent learners, while Vygotsky saw them as more dependent on others until they were older. Both views are correct, and the type of learning that takes place in early childhood depends on the specific task. Independent, “Piagetian” learning is likely to occur in nonthreatening situations in which errors are not costly (such as imaginative play). Dependent, “Vygotskian” learning is more typical of dangerous situations in which mistakes are costly (such as learning to cross a busy street).

C. Section 6.3: Language: What Develops in the First Two Years?

“On Your Own” Activity: Child-Directed Speech

This exercise asks students to make arrangements to listen to an adult having a 10- to 15-minute conversation with an infant or toddler. Afterward, students are to answer the questions in Handout 4 and return their answers to the instructor.

This exercise will help students understand and apply the text material on child-directed speech. As a follow-up, you might want to summarize the students’ responses, particularly those regarding baby talk per se (questions 3 and 4). In addition, you could provide feedback regarding the accuracy of each student’s assessment of the child’s stage of language development (question 5).

Critical Thinking Activity: Language Development: Nature, Nurture, or Interaction?

Most chapters of this resource contain a critical thinking exercise designed specifically to test students’ critical thinking about a topic covered in the text. Handout 5 briefly describes the history of language development theories followed by a series of questions. In this exercise, several examples of language use are presented; students are asked to decide whether each provides evidence of the impact of nature, nurture, or the interaction of nature and nurture in language development, and to explain their reasoning.

Answers to this chapter’s critical thinking exercise are as follows:

1. Position supported: Nurture

   Explanation: The increased frequency of Juwan’s utterance can be explained by the principle of reinforcement. According to learning theory, if babies are reinforced with food or attention when they utter their first babbling sounds, they will soon call “mama” and “dada” whenever they want their mother or father.

2. Position supported: Nature

   Explanation: The fact that Melissa correctly applies this basic rule of grammar in her very
first sentences—sentences that she probably never learned from her parents—suggests that she has an inborn facility for acquiring language.

3. **Position supported:** Nature

**Explanation:** According to Noam Chomsky, the fact that hearing and deaf children worldwide pass the various milestones of language development—such as babbling—at approximately the same age implies that the human brain is uniquely equipped with some sort of inborn language acquisition device.

4. **Position Supported:** Nature–nurture interaction

**Explanation:** This example demonstrates that the combination of learning experiences and biological maturation most accurately explains how children acquire language. Hearing your native language as an infant (a learning experience) sculpts the nervous system (a biological phenomenon), which, in turn, helps shape future language development.

**Classroom Activity: Conversation with a Toddler**

To expand on the text mention of baby talk, bring a tape of a dialogue between a parent and toddler to class. (You might ask students or faculty members with toddlers to make a tape for you.) Put the following questions on the board and ask students to formulate answers in relation to the taped dialogue. Then play the tape again and arrive at a consensus about what happens in the interaction between parent and child. Stop the tape whenever necessary to highlight and discuss a particular linguistic hallmark.

(a) What can you tell about the situation in which this conversation is taking place?
(b) What kinds of words does the child use most?
(c) What kinds of words does the adult use most?
(d) Is repetition of words or sounds an important part of the conversation? What function does repetition play?
(e) How well do the adult and child understand each other? How does each speaker respond to a verbalization that she or he doesn’t understand?
(f) Can you give any specific examples of speech used by the child that are typical hallmarks of infant language (for example, overextensions, holophrases)?
(g) How old do you think the child is (or at what stage of language development is the child)? Explain your answer.

**Classroom Activity: Classroom Debate:** “**Resolved: Language Development Is the Product of Conditioning**”

To highlight the contrasting theories of language development proposed by B. F. Skinner and Noam Chomsky, follow the guidelines in the General Resources section of this manual for scheduling a classroom debate on this resolution.

The resolution is stated in favor of the behaviorist viewpoint that linguistic development
is the product of imitation, shaping, reinforcement, and other basic operant conditioning processes. Although the behaviorist philosophy often provokes strong reactions from students, in the context of the acquisition of complex abilities such as language, it often is the “common sense” and model viewpoint: “Language development innate? Nonsense. I remember how difficult it was to learn the basic rules of grammar, punctuation, spelling, and the like. Don’t tell me that wasn’t learning!”

Skinner’s model makes a number of specific, testable predictions. For example:

(a) Language development is largely the product of learning. There should, therefore, be great individual variation in its acquisition, because no two learning environments are the same.

(b) Children imitate the early speech they hear. They should, therefore, not make grammatical mistakes, assuming that their models have not made them.

(c) Those deprived of “normal” linguistic experiences (deaf children, for example) should not develop in the same manner as those not deprived.

Encourage both teams of debaters to consider and research these predictions as they prepare their arguments. Many scholarly books and journals can provide interesting ammunition for both sides of the issue.