

Chapter 2: Biological Beginnings

Learning Goals

Learning Goal 1: Discuss the evolutionary perspective on development.

- A. Define natural selection and adaptive behavior.
- B. Discuss evolutionary psychology and the emphasis it places on adaptation.

Learning Goal 2: Describe what genes are and how they influence human development.

- A. Describe the genetic process.
- B. Explain genes and chromosomes.
- C. Define and describe genetic principles.
- D. Elucidate chromosome and gene-linked abnormalities.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and to understand the nature-nurture debate.

- A. Discuss the field of behavioral genetics.
- B. Describe heredity-environment correlations.
- C. Explain the epigenetic view and gene-gene interaction.
- D. Discuss the conclusions regarding heredity-environment interaction.

Learning Goal 4: Describe prenatal development.

- A. Define and explain the three stages of prenatal development and the major events occurring during each period.
- B. Describe the types of prenatal testing.
- C. Explain possible causes of infertility and reproductive technology.
- D. Elucidate the various hazards to prenatal development.
- E. Discuss prenatal care.

Learning Goal 5: Discuss the birth process and the postpartum period.

- A. Describe the birth process.
- B. Explain the transition from fetus to newborn.
- C. Discuss bonding in the postnatal period.
- E. Describe the postpartum period.

Overview of Resources

Chapter Outline	Resources You Can Use
The Evolutionary Perspective	Learning Goal 1: Discuss the evolutionary

	perspective on development.
Natural Selection and Adaptive Behavior Evolutionary Psychology	<ul style="list-style-type: none"> ✎ Classroom Activity 1: Critical-Thinking Multiple-Choice Questions and Answers ✎ Classroom Activity 2: Critical-Thinking Essay Questions and Suggestions for Helping Students Answer the Essays
The Genetic Foundations of Development	Learning Goal 2: Describe what genes are and how they influence human development.
The Genetic Process Genes and Chromosomes Genetic Principles Chromosome and Gene-Linked Abnormalities	<ul style="list-style-type: none"> 🎧 Lecture Suggestion 1: Three Laws of Behavior Genetics ✎ Classroom Activity 3: Principles of Genetic Transmission † Personal Application 1: All in the Family 🔍 Research Project 1: Heritability of Height
The Interaction of Heredity and Environment: The Nature-Nurture Debate	Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and to understand the nature-nurture debate.
Behavior Genetics Heredity–Environment Correlations The Epigenetic View and Gene-Gene Interaction Conclusions about Heredity-Environment Interaction	<ul style="list-style-type: none"> 🎧 Lecture Suggestion 2: Interaction Concepts 🎧 Lecture Suggestion 3: Prenatal Counseling ✎ Classroom Activity 4: Debate on Heritability of Intelligence ✎ Classroom Activity 5: Explanation for Attention Deficit Hyperactivity Disorder—Nature or Nurture? ✎ Classroom Activity 6: High-Tech Reproductive Technology † Personal Application 2: I Am What I Am † Personal Application 3: The Same but Different 🔍 Research Project 2: Genetic Counseling Available to You
Prenatal Development	Learning Goal 4: Describe prenatal development
The Course of Prenatal Development Prenatal Tests Infertility and Reproductive Technology Hazards of Prenatal Development Prenatal Care	<ul style="list-style-type: none"> 🎧 Lecture Suggestion 4: Technology and Images of Prenatal Development 🎧 Lecture Suggestion 5: Principles of Teratogenic Effects 🎧 Lecture Suggestion 6: Dangers of Drug Use during Pregnancy 🎧 Lecture Suggestion 7: Mothers’ Experiences of Pregnancy ✎ Classroom Activity 7: Killing Me Softly: Banning Smoking in Homes with Pregnant Women and Children ✎ Classroom Activity 8: The Court’s Treatment of Substance-Abusing Pregnant Women ✎ Classroom Activity 9: Fetal Alcohol Syndrome Quiz † Personal Application 4: The Pitter Patter of Little Feet † Personal Application 5: Test Your Fetal Growth

	Knowledge Online ¶ Research Project 3: Why Do Some Pregnant Women Drink, Smoke, or Use Drugs?
Birth and the Postpartum Period	Learning Goal 5: Discuss the birth process and the postpartum period.
The Birth Process The Transition from Fetus to Newborn Bonding The Postpartum Period	¶ Lecture Suggestion 8: Increase in Cesarean Births: Is It A Good Thing? ✎ Classroom Activity 10: Postpartum Depression † Personal Application 6: Oh, the Pain!
Review	✎ Classroom Activity 11: Critical-Thinking Multiple-Choice Questions and Answers ✎ Classroom Activity 12: Critical-Thinking Essay Questions and Suggestions for Helping Students Answer the Essays

Resources

¶ Lecture Suggestions

Lecture Suggestion 1: Three Laws of Behavior Genetics

Learning Goal 2: Describe what genes are and how they influence human development.

The purpose of this lecture is to extend the discussion of behavior genetics relative to the nature–nurture debate. The traditional nature–nurture debate focused on whether genes influenced complex behavioral outcomes. The answer is yes. The current nature–nurture debate focuses on how to proceed from partitioning sources of variance to specifying concrete developmental processes. Turkheimer (2000) has synthesized three laws of behavior genetics:

- First Law: All human behavioral traits are heritable.
 Second Law: The effect of being raised in the same family is smaller than the effect of genes.
 Third Law: A substantial portion of the variation in complex human behavioral traits is not accounted for by the effects of genes or families.

If the first two laws are taken literally, the nature side of the great nature–nurture debate wins. That is, genes matter and families or environment do not. However, this is a massive oversimplification. The claim that genes are involved in all traits does not preclude environmental influences. Individual genes and their environments (including other genes) interact to influence developmental processes. Interactivity is the primary component of this process. Subsequent environments are influenced by prior states, and these interactions influence developmental trajectories of the organism, which affect future expression of genes. There are no direct cause-and-effect relationships in developmental processes. Rather any individual gene or environmental event influences development only by interacting with other genes and environments.

Heritability per se has few implications for scientific understanding of development. It is important to keep in mind the following point. Heritability does not have one certain consequence. Correlations among biologically related family members are not prima facie evidence of sociocultural causal mechanisms. Just because a child of a depressed mother becomes depressed does not demonstrate that being raised by depressed mothers is itself depressing. That child might have become depressed regardless of the environment due to the influence of the mother's genes.

Related to the second and third law, Plomin and Daniels (1987) asked the question: Why are children in the same family so different from one another? They proposed that children in the same family are different because nonshared environmental events are more potent causes of developmental outcomes than shared environmental factors. In other words, children's environments, their peers, and the aspects of parenting their siblings do not share, all help explain differences between siblings. The part of the family environment that siblings do not share appears to matter more than the part of the family environment that siblings do share. Plomin and Daniels also state that the salient environment is almost impossible to research because it is a combination of unsystematic, idiosyncratic, or serendipitous events.

Genetic material is a more systematic source of variability in development than environment. Yet this statement is based on methodological issues rather than substantive issues. Genetic experiments (identical and fraternal twins) statistically assess this component better than social scientists' ability to assess nonsystematic and idiosyncratic events within environments. Turkheimer states that twin studies are a methodological shortcut, but they do not demonstrate that genes are more important than environments. Turkheimer further states that human developmental social science is difficult to conduct for two major reasons: (1) human behavior develops out of complex, interactive nonlinear processes; and, (2) experimental control is impossible to implement in human developmental processes because of ethical constraints.

Sources:

Plomin, R., & Daniels, D. (1987). Why are children in the same family so different from one another? *Behavioral and Brain Sciences*, 10, 1–60.

Turkheimer, E. (2000). Three laws of behavior genetics and what they mean. *Current Directions in Psychological Science*, 9, 160–164.

Lecture Suggestion 2: Interaction Concepts

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and to understand the nature-nurture debate.

The concept of interaction takes some time to master. There are numerous examples of interaction among the topics taught in a life-span development course. One of the clearest examples comes from the principles of gene expression.

Present a lecture on gene expression and the influence of environment. Myers (2004) addresses this issue from the standpoint of disease prevention. He raises the following key points:

- Abnormal proteins resulting from gene mutations or different forms of alleles unquestionably can and do cause disease. However, epidemiological studies ... usually reveal that only a small percentage of disease cases are actually attributable to the presence of the mutated gene....

- Inappropriate gene expression—whether or not a gene is turned on or off at the appropriate time—can be just as important to disease susceptibility....
- New research is demonstrating that low-level exposures to a variety of agents, including environmental contaminants, can alter gene expression....
- A high priority should be placed on identifying environmental agents that can disrupt gene expression....

Source:

Myers, J. (2004). Gene expression and environmental exposures: New opportunities for disease prevention. *San Francisco Medicine*, 77(4).

Lecture Suggestion 3: Prenatal Counseling

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 4: Describe prenatal development.

Students often find the role of a genetics counselor difficult to understand. Invite a genetics counselor to come and discuss what he or she does to assist couples who want testing. You might ask the counselor to discuss reasons why couples come for testing (see next paragraph) and methods of testing. If you are not able to have a guest speaker attend your class, give a lecture on these ideas.

According to the National Society of Genetic Counselors (2000), genetic counselors are health professionals with specialized graduate degrees and experience in the areas of medical genetics and counseling. They work as members of a health-care team, providing information and support to families who have members with birth defects or genetic disorders and to families who may be at risk for a variety of inherited conditions. They identify families at risk, investigate the problem present in the family, interpret information about the disorder, analyze inheritance patterns and risks of recurrence, and review available options with the family. Genetic counselors also provide supportive counseling to families, serve as patient advocates, and refer individuals and families to community or state support services.

The following reasons are among those listed by Packard Children's Hospital at Stanford (2001) for seeking a referral for genetic counseling and/or genetic evaluation:

- Family History Factors
 - previous child with, or family history of:
 - chromosome abnormalities (such as Down syndrome)
 - heart defects
 - single gene defects (such as cystic fibrosis or PKU)
 - learning disabilities
 - psychiatric disorders
 - cancers
 - either parent with an autosomal dominant disorder or any disorder seen in several generations
 - both parents carriers for an autosomal recessive disorder diagnosed either by the birth of an affected child or by carrier screening
- Pregnancy Factors
 - maternal age 35 years or greater at delivery
 - abnormal prenatal diagnostic test results or abnormal prenatal ultrasound examination

➤ Other Factors

- persons in specific ethnic groups or geographic areas with a higher incidence of certain disorders, such as Tay–Sachs disease, sickle cell disease, or thalassemias

Source:

<http://www.lpch.org/DiseaseHealthInfo/HealthLibrary/genetics/counsel.html>

Lecture Suggestion 4: Technology and Images of Prenatal Development

Learning Goal 4: Describe prenatal development.

A compelling way to bring home the value of observation as a research technique and, at the same time, stress the importance of prenatal development as a pivotal period in human development, is to present and discuss images of prenatal development. Amazing images of prenatal development are available at “The Visible Embryo” web site (<http://www.visembryo.com/baby/index.html>). The spiral represents the 23 stages occurring in the first trimester of pregnancy and every two weeks of the second and third trimesters. Use the spiral to navigate through the 40 weeks of pregnancy and preview the unique changes in each stage of human development. Images are provided for the first trimester with in-depth descriptions for all 40 weeks of pregnancy.

Lecture Suggestion 5: Principles of Teratogenic Effects

Learning Goal 4: Describe prenatal development.

The concept of an interaction (see Lecture Suggestion 2) can be further elaborated with a lecture about the principles that govern the effects of teratogens on the developing embryo. These effects vary depending upon the genotype of the mother and the baby, as well as the amount and timing of exposure to the teratogen. Some of the principles of teratogenic effect include the following:

- The effects of a teratogen vary with the developmental stage of the embryo.
Systems or organs in the process of development (organogenesis) are generally affected more than are completed organs and systems. Since the various organ systems begin and end their prenatal development at different times, their sensitivity to agents varies over time. The most vulnerable time for the brain is from 15 to 25 days postconception, for the eye from 24 to 40 days postconception, and for the heart from 20 to 40 days postconception.
- Individual teratogens influence specific developing tissue, which leads to particular patterns of developmental deviations.
German measles affects mainly the heart, eyes, and brain. Thalidomide, the anti-nausea drug from the 1960s, results in malformation of the limbs.
- Both maternal and fetal genotypes can affect the developing organism’s response to teratogenic agents and may play an important role in the appearance of abnormalities in offspring.
Not all pregnant women who used thalidomide or had German measles during early pregnancy produced infants with abnormalities.
- The physiological or pathological status of the mother will influence the action of a teratogen.
Not only will nutritional deficiencies themselves directly affect prenatal development, they also may intensify the adverse effects on the fetus of certain drugs ingested by the mother. Other maternal factors such as obesity, high blood pressure, and liver dysfunction may increase the impact of damage by teratogens.

- The level of teratogenic agent that will produce malformations in the offspring may show only mild detrimental effects on the mother, or none at all.
Radiation from X-rays, drugs (alcohol, thalidomide, etc.), and dietary deficiencies may have no impact on the mother, but cause gross deviations in the infant.

As you present each principle, relate it to the concept of interaction, as well as other relevant developmental concepts. For example, the first principle is an example of an interaction in which developmental level mediates the influence of a specific experience. This idea is related to the concepts of critical/sensitive period, fixation, and developmental readiness. The third principle provides a complicated example of heredity/environment interaction, and an example of dyadic interaction (physiological level).

Sources:

Hogge, A. (1990). Teratology. In I. R. Merkatz & J. E. Thompson (Eds.), *New perspectives on prenatal care*. New York: Elsevier.

Moore, K., & Persaud, T. (1993). *The developing human: Clinically oriented embryology* (5th ed.). Philadelphia: Saunders.

Lecture Suggestion 6: Dangers of Drug Use During Pregnancy

Learning Goal 4: Describe prenatal development.

Information about the teratogenic effects of “everyday drug use” is very important to students who may become parents in the future. You may wish to underscore this with a lecture that explores this issue in greater depth than is possible in the text. Place special emphasis on the potential dangers of even normal everyday drug use, in particular the use of caffeine (coffee), nicotine (cigarettes), and alcohol. Some important points to address include the following:

- These teratogens have graded effects which make it risky to talk about “safe” levels of exposure. For example, having just one serving of alcohol a day increases risks for developmental disorders. Fetal alcohol syndrome can have mild, moderate, or severe effects on the developing fetus.
- Effects of drug exposure may be direct or indirect. Alcohol use may lead to organic abnormalities. Nicotine use may lead to temperamental difficulties in babies, which can reduce the quality of their interactions with their caregivers.
- Risks can be vitiated by discontinuing use of the drug. It is not reasonable to continue using a drug on the grounds that harm has already been done and cannot be reversed.
- Risks may be dependent on the timing of prenatal exposure (see Lecture Suggestion 4: Technology and Images of Prenatal Development).
- The drug-use habits of both parents can affect the fetus, either directly or indirectly. Second-hand smoke has been found to adversely affect fetuses. Maternal exposure to environmental tobacco smoke for one hour or more per day is associated with spontaneous abortion (Windham & others, 1992). The quality of care and support a husband can provide to his pregnant wife could influence the outcome of the pregnancy.
- Caffeine exposure is common in pregnancy. According to Wisborg & others (2003), pregnant women who drank eight or more cups of coffee per day during pregnancy had an increased risk of stillbirth compared with women who did not drink coffee.

An important addition to your lecture could be an examination of how mothers (and fathers) can deal with drug use habits that may endanger their unborn babies. Classroom Activity 8: The

Court's Treatment of Substance Abusing Pregnant Women addresses issues related to drug use during pregnancy and the social ramifications for the mother, father, and child.

Sources:

Mills, J., et al. (1993). Moderate caffeine use and the risk of spontaneous abortion and intrauterine growth retardation. *Journal of the American Medical Association*, 269, 593–597.
Windham, G. C., Swan, S. H., & Fenster, L. (1992). Parental cigarette smoking and the risk of spontaneous abortion. *American Journal of Epidemiology*, 135, 1394–1403.
Wisborg, K., Kesmodel, U., Bech, B., Hedegaard, M., & Henriksen, T. (2003). Maternal consumption of coffee during pregnancy and stillbirth and infant death in first year of life: prospective study. *BMJ*, 326(7386):420.
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=149440>

Lecture Suggestion 7: Mothers' Experiences of Pregnancy

Learning Goal 4: Describe prenatal development.

Most life-span textbooks focus on prenatal development from the perspective of the developing baby as opposed to from the mother's perspective. Pregnant women have a variety of experiences, ranging from changes in their bodies to changes in their emotions. If women do not seek support during that time, these changes may be confusing, unexpected, and even scary. There are hundreds of conditions or symptoms that can occur for women during pregnancy. Some of the most common include:

Fatigue	from a little increased tiredness to extreme fatigue.
Nausea	often called "morning sickness," some women experience nausea and/or vomiting in the morning or all day long. This symptom can last from a few weeks to the entire pregnancy.
Frequent urination	the urge to urinate more often
Breast tenderness	increasing levels of hormones cause tender breasts
Headaches or dizziness	circulatory changes in pregnancy can cause these symptoms
Weight gain	women gain an average of 25 to 30 pounds during pregnancy
Back pain	the joints between a woman's pelvic bones soften and loosen to prepare for the baby passing through, and the center of gravity changes as the uterus enlarges; thus, the body compensates with resulting back pain or strain
Lower abdominal pain	stretching ligaments can be painful
Other symptoms	leg cramps, skin changes (darkening around the nipples and navel)

Despite the many symptoms that *may* occur for some women, there are many exciting sensations and experiences that occur with pregnancy as well, including feeling the baby move, experiencing special food cravings, being pampered by those around you, learning about your body, learning about your developing baby, preparing for parenthood, etc.

If you are in a classroom with the necessary technology, visit the following web sites or refer your students to them:

- Pictures of real women's bellies at various weeks of pregnancy can be found at <http://pregnancy.about.com/cs/pregnancyphotos/1/blbellyindex.htm>

- Pregnancy-related sites can be found on [ivillage.com](http://www.ivillage.com) at <http://www.ivillage.com/pregnancy-3/4-o-103252>

Source:

Johnson, R. V. (1994). *Mayo clinic complete book of pregnancy and baby's first year*. New York: Mayo Foundation for Medical Education and Research.

Lecture Suggestion 8: Increase in Cesarean Births: Is It A Good Thing?

Learning Goal 5: Discuss the birth process and the postpartum period.

Discuss the increasing use of cesarean births and generate a discussion on the pros and cons. Here are some ideas and questions to get you started:

Until the past 10 years or so, cesarean delivery, when the baby is removed from the mother's uterus through an incision made in her abdomen, was used only in cases when the baby was in a breech position (with the baby's buttocks rather than its head, being the first part to emerge from the vagina).

Today, however, more cesarean sections are performed in the United States than in any other country in the world. The cesarean delivery rate jumped 7.5 percent from 2002 to 2004 in the United States, to 29.1 percent of all births.

Improvements in the ability to identify babies in distress earlier in the birth process may be one explanation. Practitioners are also utilizing cesarean procedures on the increasing number of obese and seriously overweight pregnant women in this country. Other reasons include the desire of many doctors to avoid even the slim chance of a malpractice claim if something goes wrong in the normal birth process and, even more controversial, doctors and mothers wanting to schedule the baby's birth to the hour.

Ask students how many women they know who have delivered through this method. I bet most students' mothers did not deliver them that way, and that's worth asking. Ask the women if they would prefer cesarean birth to normal birth. Why?

Discuss the higher medical costs associated with cesarean delivery. Ask students if insurance companies should pay for "elective" cesarean sections. Do they believe it is ethical to expose the mother and child to the risks of major surgery without a compelling medical need?

Here is a resource to provide further background information for you and your students:

Childbirth Connection

<http://www.childbirthconnection.org/article.asp?ClickedLink=274&ck=10168&area=27>

✎ Classroom Activities

Classroom Activity 1: Critical-Thinking Multiple-Choice Questions and Answers

Learning Goal 1: Discuss the evolutionary perspective on development.

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and the nature-nurture debate.

Discuss the answers to the critical-thinking multiple-choice questions presented in **Handout 1**.

For question 1, be sure the class understands the evolutionary process. The question will provide a concrete example of natural selection.

The purpose of question 2 is to review the material presented in Chapter 1 by applying it. The goal is to become aware of these developmental issues, because they define the nature of developmental psychology.

The purpose of question 3 is to make students aware of an important assumption in the hereditarian argument about causes of intellectual differences. This exercise will help students confront Jensen's claim about the nature of intelligence by locating potential weaknesses in his argument, which otherwise appears quite strong. The answers to these critical-thinking multiple-choice questions are presented in **Handout 2**.

Logistics:

- Materials: Handout 1 (Critical-Thinking Multiple-Choice Questions) and Handout 2 (Answers).
- Group size: Small groups (2 to 4) to discuss the questions, then a full-class discussion.
- Approximate time: Small groups (15 to 20 minutes), full-class discussion of any questions (15 minutes).

Classroom Activity 2: Critical-Thinking Essay Questions and Suggestions for Helping Students Answer the Essays

Learning Goal 1: Discuss the evolutionary perspective on development.

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and the nature-nurture debate.

The purpose of this activity is threefold. First, answering the questions listed in **Handout 3** facilitates students' understanding of concepts in Chapter 2. Second, these types of essay questions afford the students an opportunity to apply the concepts to their own lives, which will in turn facilitate their retention of the material. Third, the essay format will also give students practice in expressing themselves in written form. Ideas to help students answer the critical-thinking essay questions are provided in **Handout 4**.

Logistics:

- Materials: Handout 3 (Essay Questions) and Handout 4 (Ideas to Help Answer).
- Group size: Individual, then full-class.
- Approximate time: Individual (60 minutes), full-class discussion of any questions (30 minutes).

Classroom Activity 3: Principles of Genetic Transmission

Learning Goal 2: Describe what genes are and how they influence human development.

The purpose of this activity is to help students understand the principles of genetic transmission. Ask students to bring in as complete a description as possible of the hair type (straight or curly) of

their siblings, parents, grandparents, and, if possible, great-grandparents. Some students will be unable to get the information, so it might be a good idea to break the class into groups and have each group use the data of the student with the most complete history. Using Mendel's principles of genetic transmission, have students draw genetic models that explain how they and their siblings got their hair types. Encourage the students to include their parents and grandparents in their models.

The allele for curly hair is dominant (represent it as C) and the allele for straight hair is recessive (c). Children who inherit either a homozygous pair (CC) of dominant alleles or a heterozygous pair (Cc) will have curly hair (though the Cc individuals could pass on a straight hair gene to their children, thus they are called carriers). Children who inherit a homozygous recessive pair (cc) will have straight hair.

If the father is homozygous for straight hair (cc) and the mother is heterozygous for curly hair (Cc), 50 percent of the children will be heterozygous for curly hair and 50 percent will be homozygous for straight hair.

Logistics:

- Group size: Individual or small group (2 to 4).
- Approximate time: 10 minutes.

Classroom Activity 4: Debate on Heritability of Intelligence

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and the nature-nurture debate.

The purpose of this activity is to foster thinking about the contribution of life-span developmental research for setting public policy. Divide the class into two groups to debate the issue of heritability of intelligence, and its effect on public policy. Should data about parents' (or grandparents') intelligence be used to determine what kinds of schooling to give to children? One group should provide evidence consistent with a strong genetic position on intelligence. The other group should argue a strong environmental position on intelligence. Students should think about how this issue would be further complicated by information about whether heritability of intelligence is high or low. Each side of the debate should generate evidence from the text that supports their side. The groups can select a couple of spokespersons, and let the debate begin.

Logistics:

- Group size: Divide class in half, and then full class for a debate.
- Approximate time: 25 minutes for evidence/argument development and 25 minutes for debate.

Classroom Activity 5: Explanations for Attention Deficit Hyperactivity Disorder: Nature or Nurture?

From Jarvis and Creasey, "Activities for Lifespan Developmental Psychology Courses"

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and the nature-nurture debate.

Understanding the origins of attention deficit hyperactivity disorder (ADHD) has implications for treatment and education of children with this disorder. However, the scientific community is

somewhat divided about the origins of ADHD. This activity involves students in an informed debate about the origins of the disorder.

Demonstration:

The class will be divided into two groups to debate the origins of ADHD after considering recently published articles about the disorder.

Time:

Fifteen minutes of one class period and approximately 30 minutes of another class period.

Materials:

All students will be assigned to go to the library and read the following two articles about the origins of ADHD placed on reserve by the instructor:

Joseph, J. (2000). Not in their genes: A critical view of the genetics of attention deficit hyperactivity disorder, *Developmental Review*, 20(4), 539–567.

Farone, S., & Biederman, J. (2000). Nature, nurture and attention deficit hyperactivity disorder, *Developmental Review*, 20(4), 568–581.

Procedures:

- 1) Two weeks preceding this activity, announce to the students that during the next week they are assigned to go to the library and read the two articles on ADHD. Explain that one article (Joseph) refutes genetic origins of the disorder in favor of psychosocial explanations, while the other article (Farone and Biederman) rejects the arguments of the first article in favor of a more interactive view of genetics and environment in explaining ADHD.
- 2) After a week, divide the class into two groups. This activity can accommodate larger classes by asking about five students to volunteer for each of the two groups. Assign each of the groups one of the articles to support in a class debate.
- 3) At the end of the second week, hold the informal brief debate in class. First, have each group present the main points of its article. Then ask the students to try to convince one another that either a genetic explanation for ADHD makes the most sense or that an interaction of genetics and environment is more critical to understanding ADHD. The following questions may be asked of the groups (and the class as a whole) by the instructor to stimulate discussion:
 - From a parent’s point of view, what are the pros and cons of each author’s perspective?
 - What conclusions can be drawn from this activity regarding the nature–nurture debate? What about the connections between mind and body? How might developmental psychologists differ in their positions on these issues from physicians or philosophers?
 - What implications do the authors’ perspectives have on a biological explanation for behavior?
 - How might treatment approaches for ADHD differ when considering the two authors’ perspectives on the origins of ADHD?

Classroom Activity 6: High-Tech Reproductive Technology

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development and the nature-nurture debate.

The purpose of this activity is for students to learn more about high-tech reproductive technology, including methods, costs, testing, and decisions about implantation and selective termination of pregnancy.

Before assigning this activity, explain how prospective parents, be they single men, single women, gay or lesbian partners, heterosexual partners, or married couples, have a wide range of reproductive options.

In addition, young, healthy men and women can sell their sperm or eggs to reproduction facilities that will, in turn, sell them to prospective parents. These sperm and egg donors are the actual biological parents.

There are a number of web sites available to help students research this activity. Here are a few to get them (and you!) started. Students will have no problem finding answers through their own online searches:

The International Council on Infertility Information Dissemination
<http://www.inciid.org/index.php?page=thirdparty>

Bioethics and IVF
<http://bioethics.com/?author=46>

Eggsploitation
<http://www.eggsploitation.com/>

Genetics and IVF Institute
<http://www.givf.com/>

High-Tech Sex Selection
<http://archives.cnn.com/2001/HEALTH/10/01/ethics.matters/index.html>

Assign students to look for answers to one or more of these questions as they pursue the web sites and to be prepared to discuss them in class.

1. What is the purpose of performing pre-implantation genetic tests on embryos? Do you think this is ethical?
2. Can parents choose the sex of their babies? Why would they want to do so? Do you think it is ethical? Would you do it?
3. What about the American practice of implanting multiple embryos in order to ensure one or more viable births—is that ethical? What risks for mother and child do multiple births present?
4. What kind of guarantees were made on any of the web sites you located?
5. Do you think that insurance ought to pay for high-tech reproductive techniques? Why or why not?

During class, you should be able to generate a lively discussion on this most provocative topic.

Logistics:

- Materials: None
- Group size: Individual, then full-class.

- Approximate time: Individual (60 minutes), full-class discussion of any questions (30 minutes).

Classroom Activity 7: Killing Me Softly: Banning Smoking in Homes with Pregnant Women and Children

From Jarvis and Creasey, “Activities for Lifespan Developmental Psychology Courses”

Learning Goal 4: Describe prenatal development.

In March of 2002, a child custody judge in Utica, New York, ruled that a mother must quit smoking or lose visitation rights to her child. The judge said the mother could not smoke in her home or car, whether the child was present or not. The ruling was based upon medical reports about the harm of passive or residual smoke to health. The ruling was intended to guarantee a smoke-free environment for the child. However, there is controversy over the ruling, as it raises a civil liberties issue about the rights of the mother in her private home. This activity asks students to consider the pros and cons of the ruling and provides a real application of course material to the developing child. Discussion should extend to the role of passive smoke in the homes of pregnant women (including the effects of teratogens) and in restaurants and public buildings.

Demonstration:

Instructors will introduce the topic of teratogens and present the basic case, as given above, to the class. Then, instructors will ask students to discuss pros and cons for each side of this argument. During class discussion, encourage students to explain the reasoning for their opinions and to integrate course material on teratogens into the discussion.

Time: Approximately 10 to 20 minutes.

Materials: Paper and pencil.

Procedures:

Material on teratogens and biological hazards to developing infants and children should be covered before conducting this activity. The National Center on Birth Defects and Developmental Disabilities (<http://www.cdc.gov/ncbddd/>) has a useful web site to visit prior to conducting this activity. It should be emphasized that cigarette smoking during pregnancy can result in low-birthweight babies. It has been associated with infertility, miscarriages, tubal pregnancies, infant mortality, and childhood morbidity. Additionally, cigarette smoking may cause long-term learning disabilities. Secondary smoke may also harm a mother and her developing baby. It is best, while pregnant and after the baby is born, to avoid people who are smoking, according to leading scientists at the National Center on Birth Defects and Developmental Disabilities.

Instructors should present the basic case against passive smoke as stated above.

Students should be asked to list two reasons for supporting the court ruling described above, based on class material, and two reasons why they think the judge’s ruling may be overturned on appeal. Then the class should discuss their reasoning for their opinions. Integrate course material on teratogens into the discussion.

Classroom Activity 8: The Court’s Treatment of Substance-Abusing Pregnant Women

Learning Goal 4: Describe prenatal development.

In August 1989, 23-year-old Jennifer Johnson was found guilty of delivering a controlled substance to a minor; the minor was her baby who was born a cocaine addict. She could have received a 30-year sentence, but she was sentenced to a year of house arrest in a drug rehabilitation center and 14 years of probation. In your discussion, inform students of typical effects of cocaine on offspring (babies whose mothers used cocaine during pregnancy had significantly lower cardiac output, lower stroke volume, and higher mean arterial blood pressure with a higher heart rate). Divide the class into groups and have groups discuss the questions listed in **Handout 5**.

Logistics:

- Materials: Handout 5 (The Court's Treatment of Substance-Abusing Pregnant Women Activity).
- Group size: Small groups.
- Approximate time: Small groups (30 minutes).

Sources:

Roeleveld, N., Vingerhoets, E., Zielhuis, G. A., & Gabreels, F. (1992). Mental retardation associated with parental smoking and alcohol consumption before, during, and after pregnancy. *Preventive Medicine, 21*, 110–119.

Van Bel, F., Van de Bor, M., Stijnen, T., Baan, J., & Ruy, J. (1990). Decreased cardiac output in infants of mothers who abused cocaine. *Pediatrics, 85*, 30–32.

Van Pelt, D. (1990a). Smokers' offspring more prone to asthma. *Insight, 47*.

Van Pelt, D. (1990b). Sperm abnormalities among cocaine users. *Insight, 50*.

Windham, G. C., Swan, S. H., & Fenster, L. (1992). Parental cigarette smoking and the risk of spontaneous abortion. *American Journal of Epidemiology, 135*, 1394–1403.

Classroom Activity 9: Fetal Alcohol Syndrome (FAS) Quiz

Learning Goal 4: Describe prenatal development.

The purpose of this activity is to increase students' understanding of fetal alcohol syndrome (FAS). Have students get into groups of two or three and complete the "Fetal Alcohol Syndrome Quiz" in **Handout 6**. After they have discussed the questions and indicated the answers they believe to be correct, discuss the correct answers as a class. The answers are given in **Handout 7** (explanations for some of the answers can be found at the following web sites: <http://come-over.to/multiplechoice/testexplain.htm>, <http://www.well.com/user/woa/fsfas.htm>, and <http://www.nofas.org/faqs.aspx>).

Logistics:

- Materials: Handout 6 (FAS Quiz) and Handout 7 (Answers).
- Group size: Small-group discussion and full-class discussion.
- Approximate time: Small groups (10 minutes) and full class (10 to 15 minutes).

Sources:

Kellerman, T. (2006). *Fetal Alcohol Syndrome Quiz*. <http://come-over.to/multiplechoice/fasquiz1.htm>
<http://www.well.com/user/woa/fsfas.htm>; <http://www.nofas.org/faqs.aspx>

Classroom Activity 10: Postpartum Depression

Learning Goal 5: Describe the birth process and the postpartum period.

The purpose of this activity is to increase students' understanding of psychiatric disorders that can accompany pregnancy. Pose the question: Is it possible that a mother's mental health during the postpartum period can cause her to harm herself and/or her child? Have students get into groups of two or three to discuss the well-known case of Andrea Yates as reported on the CNN.com web site and discussion in the article written by attorney and psychology professor Elaine Cassel (see link below). After they have discussed the case, lead a full-class discussion providing information on postpartum depression, including symptoms and how to help a person suffering from this disorder.

Logistics:

- Group size: Small-group discussion and full-class discussion.
- Approximate time: Small groups (10 minutes) and full-class (10 to 15 minutes).

Sources:

Cassel, E. (2002). *The Andrea Yates Verdict and Sentence: Did the Jury Do the Right Thing?* (Ms. Cassel is an attorney, professor of psychology, and contributed to the ancillaries for this course, including this Instructor's Manual). <http://writ.news.findlaw.com/cassel/20020318.html>

Williams, D. (2002). *Postpartum psychosis: A difficult defense.*
http://www.healthplace.com/communities/depression/postpartum_depression.asp

Classroom Activity 11: Critical-Thinking Multiple-Choice Questions and Answers

Learning Goal 4: Describe prenatal development.

Learning Goal 5: Discuss the birth process and the postpartum period.

Discuss the answers to the critical-thinking multiple-choice questions that are presented as **Handout 8**. The answers are provided in **Handout 9**.

Question 1 continues the theme of applying the issues from Chapter 1. Review these as necessary; again, you may want to work with a few examples from topics in Chapter 2.

Question 2 stresses the limitations of research involving teratogens. Some of the issues presented were not addressed in the textbook; however, these are important issues to consider. This question requires students to think about how the research is conducted and the conclusions that can be drawn from the various methodologies employed.

Question 3 continues to provide practice in identifying inferences, assumptions, and observations. A good discussion prior to this exercise would involve asking students whether they are beginning to develop their own criteria or procedures for discriminating these different sorts of propositions. They may find the material for this question difficult because it is largely descriptive; in fact, three of the alternatives in this question are observations. You may want to alert your students to the fact that the pattern of two inferences, two observations, and one assumption established in previous exercises has changed in this exercise.

Logistics:

- Materials: Handout 8 (Critical-Thinking Multiple-Choice Questions) and Handout 9 (Answers).
- Group size: Small groups (2 to 4) to discuss the questions, then a full-class discussion.
- Approximate time: Small groups (15 to 20 minutes), then 5 minutes for full-class discussion.

Classroom Activity 12: Critical-Thinking Essay Questions and Suggestions for Helping Students Answer the Essays

Learning Goal 4: Describe prenatal development.

Learning Goal 5: Discuss the birth process and the postpartum period.

Discuss students' answers to the critical-thinking essay questions presented in **Handout 10**. The purpose of this exercise is threefold. First, answering the essay questions further facilitates students' understanding of concepts in Chapter 2. Second, this type of essay question affords the students an opportunity to apply the concepts to their own lives, which will facilitate their retention of the material. Third, the essay format also gives students practice at expressing themselves in written form. Ideas to help students answer the critical-thinking essay questions are provided in **Handout 11**.

Logistics:

- Materials: Handout 10 (Essay Questions) and Handout 11 (Ideas to Help Answer).
- Group size: Individual, then full class.
- Approximate time: Individual (60 minutes), full-class discussion of any questions (30 minutes).

† Personal Applications

Personal Application 1: All in the Family

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development.

The purpose of this exercise is for students to recognize the varied influence of heredity and environment within a family. The power of genetics is phenomenal, and though each cell only contains 23 pairs of chromosomes, the possible manifestations of this hereditary material are nearly limitless. Sayings such as “Blood is thicker than water” indicate that we feel very close to our family members because we share inherited traits. However, we can't ignore the fact that we grow up in the same environment. To what extent does that contribute to our similarity to our siblings? Or does it? The challenge of identifying the relative influences of nature and nurture is tremendous.

Instructions for Students: Describe the major traits you share with each of your siblings. What major traits are very different for you and your siblings? Which ones do you believe are biologically based, and which ones do you think are the result of your environment? How do you explain the differences, given you have the same parents and grew up in the same family? If you are an only child, compare and contrast your traits with those of each of your parents.

Use in the Classroom: Have students contribute examples of both similar and dissimilar traits shared with siblings. Make a list on the board of all traits and discuss which ones appear to be more “nature” based, and which ones seem to be more a function of “nurture.” Are there discrepancies among what students believe or is there a common perception of inherited and non-inherited traits? Challenge students to provide evidence, counterarguments, reasoning, or research methods that might serve to determine the answer.

Personal Application 2: I Am What I Am

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development.

The purpose of this exercise is for students to understand the correlation between heredity and environment from Sandra Scarr's perspective of the three major influences on development. Genetic and situational contributions to an individual's makeup are inexorably linked, and the combination of influences impacts individuals in three distinct ways. The way in which we are raised not only impacts us because of the experience itself, but because those very experiences are the result of the combination of genetic and environmental influences on our *parents*. And it is our own genetic makeup that influences both the environmental influences that come to us, and those that we particularly seek out. The combination of these three processes of confounded influence creates the person we become.

Instructions for Students: Present your profile with regard to Sandra Scarr's three ways in which heredity and environment are correlated.

- **Passive:** What kind of environmental experiences did your parents provide for you because of who they were?
- **Evocative:** What environmental experiences did you have due to your genetic makeup?
- **Active:** What environmental experiences did you seek out due to aspects of your genetic makeup?

Use in the Classroom: Plan to help your students get in the frame of mind for thinking through these concepts. Provide examples from your own life—including specifics about parents and their characteristics, and particular inherited traits that obviously served to influence life experiences. This may be a difficult one to grasp, so you may have to have students work through it in class. If certain students feel they have good examples, have them share in order to provide as many concrete examples as possible, then have students proceed to write their full responses.

Source:

Scarr, S. (1993). Biological and cultural diversity: The legacy of Darwin for development. *Child Development, 64*, 1333–1353.

Personal Application 3: The Same but Different

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development.

The purpose of this exercise is to enable students to realize that a combination of factors contributes to one's environmental experiences. We automatically assume that because we live in the same house and have the same parents, we share the same environment with our siblings. But very few siblings would admit that they share similar life experiences. The older siblings will swear that the younger ones always get their way, and that their parents are not nearly as hard on their younger brother or sister as they were on them. The younger ones believe the older siblings get to do everything, and they are treated like babies with all their restrictions. Then there are the middle children! Developmental psychologists know that it is very different to be an older brother than to have an older brother, and that despite living under the same roof, siblings' environments are not, in fact, the same.

Instructions for Students: Consider how your environment growing up was different from those of your siblings, given you were raised in the same household.

Use in the Classroom: This can be a fun way to get students talking and sharing childhood (and even current) stories. Feel free to share some of your own, and encourage students to compare their experiences with those of their siblings. How many felt they had an overall easier time of it than their siblings? A harder time? Were their parents' reactions to them stricter, harsher, and more unfair? Conclude by emphasizing the varying circumstantial influences experienced by people functioning in very close proximity, and how that contributes to differences in behavior.

Personal Application 4: The Pitter Patter of Little Feet

Learning Goal 4: Describe prenatal development.

Learning Goal 5: Discuss the birth process and the postpartum period.

The purpose of this exercise is to prompt students to think about all that is involved in preparing to become parents. It is not just becoming a parent that is demanding and has numerous implications; planning, conceiving, and sustaining a healthy pregnancy also require a great deal of preparation as well—from both the mother and the father! The more we understand about each person's role in this delicate process, the more we can ensure a successful outcome.

Instructions for Students: If you are not yet a parent, think and write about the following.

- **Women:** Your physical condition prior to becoming pregnant—how will you take care of and prepare your body for conception? Address nutrition, physical shape, drugs, alcohol, smoking, and other environmental stressors. What might be your health-care plans (physician, midwife, etc.)? What kind of labor and delivery experience do you want (hospital versus home delivery)? Who will you want with you during this time? What postpartum situation do you anticipate? How might you prepare yourself to be an exceptional mother?
- **Men:** Your physical condition prior to conception—address nutrition, physical shape, drugs, alcohol, smoking, and other environmental stressors. How do you plan to support the mother during pregnancy? Labor and delivery? Postpartum? Were you surprised to read of the important role fathers play in this extensive process? How might you prepare yourself to be an exceptional father?

Use in the Classroom: Put together several different profiles of couples, or single women, who want to conceive or are already experiencing pregnancy. Present the profiles to students to read, then have a class discussion on the implications of the various circumstances surrounding each pregnancy and impending birth. Emphasize the dangers of poor choices, the risks of particular behaviors, and the benefits of planning, preparation, and healthy living.

Personal Application 5: Test Your Fetal Growth Knowledge Online

From Jarvis and Creasey, "Activities for Lifespan Developmental Psychology Courses"

Learning Goal 4: Describe prenatal development.

As students may think they have prenatal development and pregnancy knowledge mastered by the end of this chapter, we offer an opportunity to test their knowledge in class using an online quiz. This activity is useful at the end of material on fetal growth.

Demonstration:

Instructors will access an online Fetal Growth Knowledge Quiz at the iVillage web site in class and have students complete it. Discussion of the correct answers should follow the quiz.

Time: Approximately 5 to 10 minutes.

Materials:

Instructors will need access to the Internet to find the online 10-item Fetal Growth Quiz.

Procedures:

- 1) Fetal growth and development should be covered before conducting this activity.
- 2) Instructors will access an online quiz on fetal growth from the following web site:
<http://www.ivillage.com/pregnancy-basics-quiz/4-q-116365>
While the above web site address worked for us, instructors may also simply use their favorite search engine (we use Google.com) to go to ivillage.com and then go to Lamaze.com quizzes and click on “Is It Bigger than a Bread Box: The Fetal Growth Quiz” to view the quiz for this activity.
- 3) The quiz has 10 items and asks about the size of the fetus at various points in development, the purpose of the notochord in the sixth week, when fingers and toes are visible, changes in the mother’s body to accommodate the developing fetus, the function of vernix, responses by the baby to external stimuli, when the baby’s head moves into the mother’s pelvis, and how the baby breathes within the mother. It is designed for prospective parents but is interesting to students studying development and nicely summarizes some of the main points covered in the course on prenatal development.
- 4) Students will take the online quiz in class, and instructors should discuss correct answers after the quiz is taken with the students. To obtain the correct answers, the instructor should answer the questions online with the help of the class, after students have had a chance to answer on their own. When the quiz is answered completely, a score sheet is offered with the correct answers. Those students who missed more than one or two questions should be instructed to review material on fetal growth more thoroughly and re-take the quiz on their own if they would like to do so.
- 5) This web site offers links to other resources about pregnancy that instructors and students may find helpful.

Personal Application 6: Oh, the Pain!

Learning Goal 5: Discuss the birth process and the postpartum period.

The purpose of this exercise is for students to recognize the various ways the human body carries out and experiences the same biological processes. Giving birth is, for mammals, one of nature’s most fundamental experiences. It involves a series of physiological stages that all members of the same species are programmed to go through. However, rarely are they experienced in the same way and to the same degree by different mothers. As we have been studying the influences of both biology and environmental factors on human behavior, it is important to recognize the varying contributions of both to such a fundamental life process.

Instructions for Students: Ask your mother if she can recall her experience giving birth to you and your siblings. If you are a parent, recall the experience of the birth of your child/children. What is different about each situation? What is similar? What might account for the differences? What factors might contribute to the variety of birthing experiences women have?

Use in the Classroom: Comparing labor and delivery stories can be very interesting and informative. If you feel comfortable, share your own stories of the birth of your children, and bring in contrasting stories from friends and family. Have students share their stories, and follow these up with a discussion of what might contribute to each mother's particular experiences. Have students then try to conclude which of those factors result from nature and which may be due to environmental circumstances. Were there any aspects of labor and delivery that the mother may have been able to change somehow? Were there any mothers who had drastically different birthing experiences with their different children? Why might this have been?

🔍 Research Project Ideas

Research Project 1: Heritability of Height

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development.

The purpose of this project is to demonstrate the concept of heritability by using height as an example (**Handout 12**). Have students do a kinship study of two families (one of the families can be their own) to collect the necessary data. Students should record the height of all family members over 18 years of age and separate them by sex. Next, they should calculate the mean and range of heights of both sexes for both families and compare them. This exercise is intended to give them experience both with a kinship study design and with the concept of having a variable with a clear operational definition. Once data collection is completed, students should answer the questions that are listed at the end of **Handout 12**.

Use in the Classroom: Have students examine family differences for the following factors:

- Evidence for the heritability of height: The expectation is that the closer the relatives are genetically, the more similar the characteristic measured will be—identical twins, fraternal twins and siblings, parents (blood), uncles and aunts, cousins, etc...
- Environmental influences: The data from those in the older generations may be difficult to interpret because 60 or more years ago different health and nutrition standards may have influenced growth (cohort effects).
- The effect of gender: The data must be segregated by sex because humans are sexually dimorphic in height. Males are characteristically larger than females.
- Advantages of using height as a measure rather than intelligence or temperament: Height is a good measure to use because it has an easy, uncontroversial, operational definition. Intelligence and temperament are harder to define in exact terms and are therefore more controversial.

Research Project 2: Genetic Counseling Available to You

Learning Goal 2: Describe what genes are and how they influence human development.

Learning Goal 3: Characterize some of the ways that heredity and environment interact to produce individual differences in development.

Chapter 2 introduces the concept of genetic counseling and how genetic counseling can help expectant parents learn about the possibility that their infants will suffer from genetically based problems. While the focus in the text is on the process of counseling, it does not say much about how this service is delivered from community to community.

For this project, have students find out if genetic counseling services are available in your community (**Handout 13**). They will want to discuss how people can find out about these services. Form groups of up to four individuals, and divide the following tasks between individuals or pairs. Students should contact hospitals to learn whether they disseminate information about genetic counseling, and, if they do, students should obtain the pamphlets or handouts that they provide. If there are other services or organizations for expectant parents (e.g., Planned Parenthood or divisions of social service agencies), they should find out what they offer. If the students can identify individuals in the community who provide such information, they should contact them to see if they will allow the students to interview them about their services. In addition, they can go to the public library and look up books or other reference materials about genetic counseling.

Once students have determined what information is publicly available, have them write a report that answers the questions at the end of **Handout 13**.

Use in the Classroom: Have the groups report their findings to the class, and then lead a general discussion to summarize the findings. Are the reports consistent? Why or why not? How well do the results correspond to the material in the text? What implications do the findings have for people seeking genetic counseling in your area?

Research Project 3: Why Do Some Pregnant Women Drink, Smoke, or Use Drugs?

Learning Goal 4: Describe prenatal development.

The dangers of drinking alcohol, smoking, and other drug use on fetal development are now well known and widely publicized. Despite this fact, many women continue to use these substances while they are pregnant. This research activity attempts to find out why (**Handout 14**).

Have students ask a number of female friends who smoke or drink to talk to them about whether they will do these things when they are pregnant. Then have them ask their friends whether they know that smoking and drinking endanger prenatal development and about what they know in detail. Have them talk about the dangers, and then ask again whether their friends will drink and smoke. You may want to suggest that students prepare an interview schedule of questions to ask. Be sure to instruct the students to avoid judgmental statements and to interview the women individually so their answers will be confidential.

Discuss the findings in class. Do different people give different reasons? Or are there common reasons among many? Discuss whether the women suggested ways that the message about the dangers of drinking and smoking for prenatal development can be made more convincing to prospective parents.

Source:

Salkind, N. (1990). *Child development*. Fort Worth: Holt, Rinehart, & Winston.

Research Project 4: Fatherhood

Learning Goal 5: Discuss the birth process and the postpartum period.

How actively are fathers participating in the births of their children? Have students find out by carrying out the interview project described in **Handout 15**. They should identify two first-time,

expectant fathers and two fathers of children under the age of 2, and then interview these men using the questions provided:

Instruct students to write a brief report summarizing their findings. They should describe their sample and how they interviewed the fathers and soon-to-be fathers, and then summarize similarities and differences between the two pairs of men. Finally, they should relate what they learned to material on fathers' participation in childbirth from the text.

Have students form groups of three or four to discuss and compare their findings. Have each group report to the class to identify any trends and generalizations that seem warranted by their findings.

Source:

Salkind, N. (1990). *Child development*. Fort Worth: Holt, Rinehart, & Winston.

Video

VAD segment #3003: Transition to Parenting—Heterosexual Married Couple

The weeks immediately after childbirth present a number of challenges for new parents and their offspring. It is a time when the woman adjusts, both physically and psychologically, to the process of childbearing. It lasts for about six weeks or until the body has completed its adjustment and has returned to a nearly prepregnant state. The baby has to be cared for; the mother has to recover from childbirth; the mother has to learn how to take care of the baby; the mother needs to learn to feel good about herself as a mother; and those close to the mother—such as her husband, a partner, grandparents, siblings, or friends—need to provide help and support.

McGraw-Hill's Visual Asset Database (VAD 2.0) for Lifespan Development

Jasna Jovanovic, California Polytechnic State University

McGraw-Hill's Visual Asset Database is a password-protected online database of hundreds of multimedia resources for use in classroom presentations, including original video clips, audio clips, photographs, and illustrations—all designed to bring to life concepts in developmental psychology. VAD can be accessed through your text's Online Learning Center at <http://www.mhhe.com/santrockessls>.

VAD segment #3004: Interview with Adoptive Parents

Adoption is the social and legal process by which a parent-child relationship is established between people unrelated at birth. A very low percentage of children in the United States are adopted. At one time, adoptive couples were mostly White, middle- to upper-class individuals in their thirties and forties. Today, adoption agencies are looking for more diverse parents.

Multimedia Courseware for Child Development

Charlotte J. Patterson, University of Virginia

This video-based two-CD-ROM set (ISBN 0-07-254580-1) covers classic and contemporary experiments in child development. Respected researcher Charlotte J. Patterson selected the video and wrote modules that can be assigned to students. The modules also include suggestions for additional projects as well as a testing component. Multimedia Courseware can be packaged with the text at a discount.

Media Resources for Teaching Psychology

McGraw-Hill and The Discovery Channel™ have formed an exclusive partnership to bring you video segments and interactivities for use in your psychology courses. They are available either as a DVD + CD-ROM set (ISBN 0-07-293885-4) or as a set of two VHS videocassettes + CD-ROM (ISBN 0-07-293884-6).

McGraw-Hill also offers other video and multimedia materials; ask your local representative about the best products to meet your teaching needs.

Feature Film

In this section of the Instructor's Manual, we suggest films that are widely available from local video rental outlets.

Immediate Family (1989)

Starring Glenn Close, James Woods, Mary Stuart Masterson, Kevin Dillon
Directed by Jonathan Kaplan

Married 10 years, an infertile couple turns to adoption. Through an agency, they meet a teenage single mother. They spend time together, eventually creating a bond, and she agrees to sign away custody to the couple. But things don't go exactly as planned, and they are all emotionally tested waiting for the young girl to do the right thing.

Mask (1985)

Starring Eric Stoltz, Cher, Sam Elliott, Laura Dern
Directed by Peter Bogdanovich

A boy with a massive facial skull deformity attempts to live a normal life. He is extremely intelligent, has a wonderful personality, and is an emotionally warm child. His mother lives a wild lifestyle but is determined that her son be given the same chances at happiness that everyone else takes for granted.

Web site Suggestions

At the time of publication, all sites were current and active; however, please be advised that you may occasionally encounter a dead link.

A Primer on Premies

<http://kidshealth.org/parent/growth/growing/preemies.html>

Apgar Scoring

<http://www.childbirth.org/articles/apgar.html>

Behavior Genetics Association

<http://www.bga.org/>

Childbirth

<http://www.childbirth.org/>

Children's Disability Information
<http://www.childrensdisabilities.info/>

Evolutionary Psychology FAQ
<http://www.anth.ucsb.edu/projects/human/evpsychfaq.html>

Fetal Development and Prenatal Diagnosis
<http://www.amnionet.com/>

Fertility Weekly: A Weekly Digest on Fertility and Human Reproductive Science
<http://www.fertilityweekly.com/>

Holt International Children's Services: Adoptions
<http://www.holtintl.org/>

National Down Syndrome Society
<http://www.ndss.org/>

National Society of Genetic Counselors
<http://www.nsgc.org/>

Postpartum Depression
<http://www.psycom.net/depression.central.post-partum.html>

Teratology Society: Birth Defects Research | Education | Prevention
<http://www.teratology.org/>

The Endowment for Human Development
<http://www.ehd.org/prenatal-images-index.php>

The Visible Embryo
<http://www.visembryo.com/>

Scroll down for handouts available with this chapter.

Handout 1 (CA 1)

Critical-Thinking Multiple-Choice Questions

1. At one time, there were both tall and short giraffes. The short giraffes could only feed from the sides of the trees since they were unable to reach the tops of the trees. There are no short giraffes today. What concept described in Chapter 2 best explains the disappearance of short giraffes? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.
 - a) genetic imprinting
 - b) genetic foundations of development
 - c) meiosis
 - d) natural selection
 - e) bidirectional view

2. Chapter 1 describes several important issues in developmental psychology. Which of these issues receives the greatest emphasis in Chapter 2? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.
 - a) biological, cognitive, and social processes
 - b) continuity versus discontinuity
 - c) nature versus nurture
 - d) stability versus change
 - e) periods of development

3. A recurrent and often bitter controversy in the study of intelligence is the issue of how heredity and environment contribute to intelligence. Arthur Jensen, a leading figure in the debate, has contributed both data and argument to the “nature” view. Which of the following statements represents an important assumption, rather than an inference or an observation, in Jensen’s argument? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.
 - a) Identical twins have identical genetic endowments.
 - b) Identical twins should have IQs that are more similar than the IQs of ordinary siblings.
 - c) The correlation between IQs of twins reared together is .89.
 - d) Differences between the correlations of IQs for twins reared together versus those of twins reared apart indicate that environment has only a weak effect on intelligence.
 - e) The environments of twins reared together versus those of twins reared apart are very different.

Answers for Critical-Thinking Multiple-Choice Questions

1. At one time, there were both tall and short giraffes. The short giraffes could only feed from the sides of the trees since they were unable to reach the tops of the trees. There are no short giraffes today. What concept described in Chapter 2 best explains the disappearance of short giraffes? Circle the letter of the best answer, and explain why it is the best answer, and why each other answer is not as good.
 - a) Genetic imprinting is not the best answer. It refers to the differing effects genes can have when they are inherited either from the mother or the father.
 - b) Genetic foundations of development is not the best answer. It focuses specifically on genes, and how they transmit the characteristics of a species from one generation to another.
 - c) Meiosis is not the best answer. It describes a specialized form of cell division.
 - d) Natural selection is the best answer, as it refers to the evolutionary process by which the best adapted within a species survive and reproduce.
 - e) Bidirectional view is not the best answer. It refers to human evolution, and how environmental and biological conditions influence each other.

2. Chapter 1 describes several important issues in developmental psychology. Which of these issues receives the greatest emphasis in Chapter 2? Circle the letter of the best answer, and explain why it is the best answer, and why each other answer is not as good.
 - a) Biological, cognitive, and social processes in development is not the best answer. These processes are simply not uniformly discussed in the chapter. The focus of the chapter is on one aspect of biological processes: genetic determination.
 - b) Continuity versus discontinuity is not the best answer. The course of development—either prenatally or postnatally—is not described.
 - c) Nature versus nurture is the best answer. This is a continuing theme of the chapter, throughout which the point is made that environments interact with genotypes in the course of development. For example, natural selection determines which genotypes survive. In the discussion of genetic principles, it is clear that genetic expression is a function, in varying degrees, of environmental influence. Research on intelligence is driven by the question of how much of the variation in each individual is determined by heredity and how much by environment.
 - d) Stability versus change is not the best answer. There is material on this issue in the discussion of intelligence, but the issue is not as pervasive as the nature–nurture issue.
 - e) Periods of development is not the best answer. These simply receive no treatment in this chapter. The discussion of the biological bases of development is not organized around separate developmental periods.

3. A recurrent and often bitter controversy in the study of intelligence is the issue of how heredity and environment contribute to intelligence. Arthur Jensen, a leading figure in the debate, has contributed both data and argument to the “nature” view. Which of the following statements represents an important assumption, rather than an inference or an observation, of Jensen’s argument? Circle the letter of the best answer, and explain why it is the best answer, and why each other answer is not as good.

- a) Identical twins have identical genetic endowments is an observation. It is a factual statement about the nature of identical twins' heredity.
- b) Identical twins should have IQs that are more similar than the IQs of ordinary siblings is an inference. It is a hypothesis about the correlations based on the belief that heredity makes an important and direct contribution to individual differences in intellectual ability.
- c) The correlation between IQs of twins reared together is .89 is an observation taken directly from research on the correlations of IQs in twins reared together.
- d) Differences between the correlations of IQs for twins reared together versus those of twins reared apart indicate that environment has only a weak effect on intelligence is an inference. It interprets the finding that these two types of correlation do not differ very much.
- e) The environments of twins reared together versus those of twins reared apart are very different is the assumption. According to the text, Jensen and others have not verified this belief about the environments of twins reared together and twins reared apart, but rather take it for granted that these environments differ. In fact, this belief is a point that critics of Jensen's work have challenged.

Handout 3 (CA 2)

Critical-Thinking Essay Questions

Your answers to these kinds of questions demonstrate an ability to comprehend and apply ideas discussed in this chapter.

1. Explain the concepts of natural selection and evolutionary psychology.
2. Explain the relationship between genes, chromosomes, and DNA. Also indicate how these entities function in reproduction.
3. In your own words, what is a genotype, and what is a phenotype? Explain how these concepts relate to the concepts of dominant and recessive genes.
4. Describe the methods used by behavior geneticists to study heredity's influence on behavior.
5. Name and explain at least three examples of abnormalities in genes and chromosomes.
6. Assume that you have received a number of tests to assess fetal abnormalities. Identify and explain each procedure, and what you would learn from it.
7. What is infertility? What causes infertility? Explain what an infertile couple can do to have a baby.
8. How would you explain to a friend that heredity and environment interact in various ways to produce developments? To help your friend understand this concept, be sure to provide in your explanation an example of each of the three types of interaction and shared and nonshared environmental influences.

Handout 4 (CA 2)

Ideas to Help You Answer Critical-Thinking Essay Questions

1. These concepts are inherently connected to specific examples of the phenomena of this aspect of development. Read the examples presented in the text, then come up with your own example(s). Use this to launch your explanation of natural selection and evolutionary psychology and their tenets.
2. A visual representation will be helpful when approaching this essay. Create a careful drawing of genes, chromosomes, and DNA, as there is a building block structure to these. Establishing their physical relationship to one another will provide a clearer context in which to explain their roles in reproduction.
3. The best way to describe something in your own words is to either teach someone else about it or pretend to teach it to someone else. When you imagine approaching an audience who knows nothing about the subject matter, it causes you to explain things in a number of different ways, anticipate questions regarding the topic, and provide explicit examples to demonstrate the concepts. Do this as you write about genotypes, phenotypes, and dominant and recessive genes.
4. Begin by describing the bigger issue of trying to assess the relative influences of biology and the environment on behavior. This will provide the context to better explain and understand the methods used to study the specific contributions of heredity.
5. For a more complete learning experience, combine your efforts on this question and the next. Create a grid delineating genetic and chromosomal abnormalities on one axis. On the other, list the tests used to assess fetal abnormalities. In the resulting intersecting squares, describe the characteristics and causes of the abnormalities, and the procedures and results of the testing methods relating to them.
6. Look at the suggestion for question 5 above for help on this question.
7. Pretend you are providing counseling to couples having difficulty conceiving a child. Your job is to inform them about the nature of infertility, what may contribute to it, and their options to overcome it.
8. Begin with either a brief story about your life and description of the person you have become, or have your friend provide one. Make a list of what you believe are genetic-based traits, and a list of traits you have acquired from experience. This will demonstrate the difficulty in knowing for certain the contributions of nature and nurture in an individual's development, and will provide a preface for your presentation of examples for each of the three types of interaction and shared and non-shared environmental influences.

Handout 5 (CA 8)

The Court's Treatment of Substance-Abusing Pregnant Women Activity

1. Do you think that mothers who use drugs during pregnancy should face criminal prosecution?
2. Might this policy keep some pregnant women from getting prenatal care and having a hospital delivery?
3. How far should the prosecution go?
4. What alternative solutions can you suggest?
5. Is fetal abuse equivalent to child abuse?
6. Should fathers who use drugs during their partner's pregnancy face criminal prosecution?
[According to Windham & others (1992), maternal exposure to environmental tobacco smoke for one hour or more per day is associated with spontaneous abortion. According to Roeleveld & others (1992), paternal smoking is related to mental retardation in offspring.]
7. Do you think a wife should be able to sue her husband for infertility problems caused by use of cocaine? (Cocaine usage lowers sperm count, increases abnormally shaped sperm, and decreases sperm mobility. Infertility problems may last more than two years after a man quits using cocaine.)
8. Research suggests that mothers who smoke tobacco during pregnancy and up to the time their children are 5 years old increase the risk of their offspring getting asthma. Should smoking mothers be prosecuted?

Fetal Alcohol Syndrome (FAS) Quiz

1. Which set of definitions best matches these terms: fetal alcohol syndrome (FAS), fetal alcohol effect (FAE), fetal alcohol spectrum disorders (FASD)?
 - a) FAS is an umbrella term for all of the effects from alcohol consumption in pregnancy; FAE refers to a diagnosis given by doctors for the combination of mental retardation, stunted growth, and facial abnormalities in an infant, caused by alcohol consumption by the mother in pregnancy; FASD refers to those effects of alcohol consumption in pregnancy that are not part of the classic set of effects in a diagnosis of FAE.
 - b) FAS refers to a diagnosis given by doctors for the combination of mental retardation, stunted growth, and facial abnormalities in an infant, caused by alcohol consumption by the mother in pregnancy; FAE is an umbrella term for all of the effects from alcohol consumption in pregnancy; FASD refers to those effects of alcohol consumption in pregnancy that are not part of the classic set of effects in a diagnosis of FAS.
 - c) FAS refers to a diagnosis given by doctors for the combination of mental retardation, stunted growth, and facial abnormalities in an infant, caused by alcohol consumption by the mother in pregnancy; FAE refers to those effects of alcohol consumption in pregnancy that are not part of the classic set of effects in a diagnosis of FAS; FASD is an umbrella term for all of the effects from alcohol consumption in pregnancy.

2. What is the leading known cause of mental retardation in Western civilization today?
 - a) Down syndrome
 - b) prenatal exposure to alcohol
 - c) prenatal exposure to illicit drugs
 - d) folic acid deficiency
 - e) prematurity

3. Approximately what percentage of women of childbearing age drink alcohol (many before they realize they are pregnant)?
 - a) 10 percent
 - b) 25 percent
 - c) 35 percent
 - d) 55 percent
 - e) 75 percent

4. What is the cause of fetal alcohol syndrome?
 - a) Alcohol in the pregnant woman's bloodstream contracts her blood vessels and prevents her from providing the fetus with adequate nutrition.
 - b) Alcohol in the pregnant woman's bloodstream crosses the placenta into the unborn fetus's system and disrupts its ability to get enough oxygen for normal growth and development.
 - c) Alcohol in the pregnant woman's bloodstream makes her reckless and more likely to fall or otherwise cause injury to the fetus.
 - d) Alcohol in the pregnant woman's bloodstream makes her irritable and irrational, and her bad temper affects the fetus's development.

- e) Alcohol in the pregnant woman's bloodstream upsets her hormonal balances and prevents her from delivering the right amounts of testosterone to a male fetus or estrogen to a female fetus.
5. What is the incidence rate of FAS in the United States? Estimates vary but most are in the range of:
- a) 0 to 20 per 1,000 live births
 - b) 10 to 15 per 1,000 live births
 - c) 3 to 7.5 per 1,000 live births
 - d) 0.33 to 1.0 per 1,000 live births
 - e) 0.2 to 0.5 per 1,000 live births
6. How much does it cost each year to treat infants, children, and adults with full FAS in the United States?
- a) \$250,000 each year
 - b) \$1,900,000 each year
 - c) \$2,800,000 each year
 - d) \$5,400,000,000 each year
 - e) almost nothing, as expenses are incurred by private insurance
7. Which of the following groups of women is at high risk for drinking during pregnancy?
- a) women with a college education
 - b) unmarried women
 - c) female students
 - d) women in households with greater than \$50,000 annual income
 - e) all of the above
8. In which of the following ways does alcohol affect a man's ability to father healthy children?
- a) lowered levels of testosterone that interfere with sexual performance
 - b) reduced mobility of healthy sperm at time of conception
 - c) increased risk of inherited tendency toward alcoholism
 - d) possible adverse effects on DNA in sperm before conception
 - e) all of the above

Sources:

Questions 1, 2, 6, 7, and 10 from <http://come-over.to/multiplechoice/fasquiz1.htm>
<http://www.nofas.org/faqs.aspx>
<http://www.well.com/user/woa/fsfas.htm>

Answers to the Fetal Alcohol Syndrome (FAS) Quiz

1. c) FAS refers to a diagnosis given by doctors for the combination of mental retardation, stunted growth, and facial abnormalities in an infant, caused by alcohol consumption by the mother in pregnancy; FAE refers to those effects of alcohol consumption in pregnancy that are not part of the classic set of effects in a diagnosis of FAS; FASD is an umbrella term for all of the effects from alcohol consumption in pregnancy.
2. b) prenatal exposure to alcohol
3. d) 55% (The actual figure is 54.9%.)
4. b) Alcohol in the pregnant woman's bloodstream crosses the placenta into the unborn fetus's system and disrupts its ability to get enough oxygen for normal growth and development.
5. d) 0.33 to 1.0 per 1,000 live births
6. d) \$5,400,000,000 each year
7. e) all of the above
8. e) all of the above

See the explanation of these answers on the following web sites:

Answers 1, 2, 6, 7, and 10: <http://come-over.to/multiplechoice/testexplain.htm>

<http://www.nofas.org/faqs.aspx>

<http://www.well.com/user/woa/fsfas.htm>

Critical-Thinking Multiple-Choice Questions

1. Chapter 2 illustrates a number of the issues discussed in the Nature of Development box presented in Chapter 1. Which of the following topics taken from Chapter 2 correctly illustrates the Chapter 1 topic paired with it? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.
 - a) germinal, embryonic, and fetal periods: stability
 - b) embryonic development: maturation
 - c) teratology: biological determinants and influences
 - d) miscarriage/abortion: discontinuity
 - e) what to expect when you are expecting: cognitive processes

2. Teratology is the field that investigates the causes of birth defects. Research has found that certain agents influence the development of birth defects. Which of the following is *not* a concern regarding the research methodology involved in teratology? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.
 - a) exposure to many teratogens
 - b) long-term effects
 - c) animal research
 - d) correlational research
 - e) potential effects

3. During the past two decades, parents, researchers, and physicians have reacted against the so-called standard childbirth, once very widely practiced in American hospitals. Most have begun to favor a variety of prepared or natural forms of childbirth. Which of the following statements represents a basic assumption of standard childbirth practice that critics have rejected? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.
 - a) Important individuals were excluded from the birth process.
 - b) The mother was separated from her infant in the first minutes and hours after birth.
 - c) Giving birth was like a disease.
 - d) Babies were slapped or spanked.
 - e) Babies were scared by the bright lights.

Answers for Critical-Thinking Multiple-Choice Questions

1. Chapter 2 illustrates a number of the issues discussed in the Nature of Development box presented in Chapter 1. Which of the following topics taken from Chapter 2 correctly illustrates the Chapter 1 topic paired with it? Circle the letter of the best answer and explain why it is the best answer and why each other answer is not as good.
 - a) Germinal, embryonic, and fetal periods do not illustrate the concept of stability. Prenatal development involves rapid and radical change, not stability. These phases better illustrate periods of development.
 - b) Embryonic development illustrates the concept of maturation. Embryonic development illustrates a clear, orderly sequence of changes that most likely are dictated by a genetic blueprint.
 - c) Teratology does not illustrate the concept of biological determinants and influences. Teratogens do influence biological development, rather they are environmental influences.
 - d) Miscarriage/abortion do not illustrate the concept of discontinuity. The concept of discontinuity is that development produces qualitatively new and different features, often in what appears to be a progression of stages. These events represent an end to development.
 - e) What to expect when you are expecting does not illustrate the concept of cognitive processes. Cultural beliefs live in the minds of people, but their practical influence on the developing fetus is social—shaping the parental practices that dictate the fetus’s environment and the parents’ relationships with the unborn child.

2. Teratology is the field that investigates the causes of birth defects. Research has found that certain agents influence the development of birth defects. Which of the following is *not* a concern regarding the research methodology involved in teratology? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.
 - a) Exposure to many teratogens is not the best answer. Given that every fetus is exposed to teratogens, it is difficult to determine which one influenced the birth defect, thus exposure to many teratogens is a methodological issue.
 - b) Long-term effects is not the best answer. Given that some of the effects of teratogens are not evident until later in development (about half are evident at birth), long-term effects are a methodological concern.
 - c) Animal research is not the best answer. Much of teratology research is conducted on animals, and there are questions as to the generalizability to human prenatal development of the animal research findings.
 - d) Correlational research is not the best answer. Given that experiments involving exposure to teratogens cannot ethically be conducted on humans, cause-and-effect statements should not be made.
 - e) Potential effects is the best answer. Given the correlational nature of teratogen studies, one avoids methodological issues if potential effects are discussed rather than stating cause-and-effect relationships.

3. During the past two decades, parents, researchers, and physicians have reacted against the so-called standard childbirth, once very widely practiced in American hospitals. Most have begun to favor a variety of prepared or natural forms of childbirth. Which of the following

statements represents a basic assumption of standard childbirth practice that critics have rejected? Circle the letter of the best answer, and explain why it is the best answer and why each other answer is not as good.

- a) Important individuals were excluded from the birth process is an observation. It is a straightforward statement about who was allowed to be present at a birth.
- b) The mother was separated from her infant in the first minutes and hours after birth is an observation.
- c) Giving birth was like a disease is an assumption and thus the best answer. The statement does not describe any specific practice, but rather expresses the guiding analogy that directed medical procedures for assisting a birth.
- d) Babies were slapped or spanked is an observation. It is a practice that Lamaze vehemently rejected.
- e) Babies were scared by the bright lights is an inference. It states the presumed (but not directly known) effect of bright lights on newborn infants.

Critical-Thinking Essay Questions

Your answers to these kinds of questions demonstrate an ability to comprehend and apply ideas discussed in this chapter.

1. Describe development during the germinal, embryological, and fetal periods. Also, explain what factors might contribute to complications at specific times during gestation.
2. What is organogenesis, and why is this concept important to the process of development?
3. Discuss medical, ethical, psychological, and personal issues pertinent to the decision to have an abortion.
4. Define *teratogen* and give at least two examples of teratogens and their specific effects.
5. Compare and contrast the risks to expectant mothers who are: teenagers, twenty-somethings, or thirty-somethings.
6. Describe the stages of birth, and explain three birth complications.
7. Imagine that you are about to give birth. What questions about cesarean sections and the use of drugs during delivery would be important to you? What reasons would lead you to accept or reject a cesarean section and drugs such as tranquilizers, sedatives, and analgesics during delivery?
8. Imagine that you are an expectant parent. What would you do and learn in a parent education class on pregnancy, prenatal development, and childbirth strategies?
9. Why and how have fathers become more involved in childbirth? Discuss the pros and cons of this involvement.
10. How do preterm and low-birthweight infants differ?
11. What would you learn about your newborn from the Apgar and Brazelton Neonatal Behavioral Assessment Scales?
12. Explain why some claim that the postpartum period should be termed the fourth trimester.

Handout 11 (CA 12)

Ideas to Help You Answer Critical-Thinking Essay Questions

1. Create a timeline for the prenatal stages of development. Note developmental milestones along with periods associated with particular concerns about complications.
2. In describing the nature of organogenesis, you will automatically address why it is important to the process of development.
3. Few people can address this issue from an objective standpoint, yet that is your challenge here. Make a chart and include each of the four issues listed as pertinent to the consideration of an abortion. Referring to the text, list the relevant information in each category to compile a substantial presentation of information upon which to base such a decision. As you discuss what you have considered for each category, weigh the significance of your information based on its scientific merit, objectiveness, and meaningfulness with regard to the contribution toward a sound conclusion.
4. Do this in your own words. Read the description in the text, then expand on it, including a presentation and discussion of examples and their particular effects.
5. Create a chart with all the possible risks, both physiologically and environmentally based, for the varying age groups of pregnant women. Color code each maternal age group, then indicate the particular groups associated with each risk. This will provide a concrete illustration of maternal age and the associated risks of pregnancy shared by, and different for, each group.
6. Imagine you are teaching a childbirth class, and your job is to inform expectant parents of the stages of birth and to explain the three particular birth complications. Anticipate their particular questions and concerns to create a more complete presentation of the information.
7. Begin by rereading the relevant sections of the text, imagining that either you are pregnant or your partner is about to give birth. As you bring this personal perspective to your consideration of the information, you should easily begin to develop questions as you would if you were actually facing these circumstances yourself.
8. If you are an expectant parent, you will approach pregnancy, prenatal development, and childbirth in very practical terms. You are less interested in the information for the information itself, but rather you want to be able to apply it. This is a primary reason for the existence of childbirth classes—to inform parents regarding what they can do to successfully experience each of these stages based on the scientific information.
9. Begin by thinking about your own father's involvement. Ask your mother or your father about the extent of his role during your mother's pregnancy, labor and delivery, and childrearing. Compare what you find out to what you now know about the new and changing role of fathers.
10. Preterm infants always experience low birthweight, but the opposite is not true. Explain why that is, and what leads to each.

11. Present this information as if you were a pediatrician explaining these assessments to new parents. Remember, they are likely to have no working knowledge of developmental psychology.
12. Begin by describing the “first” three trimesters to establish the context for explaining the views about the postpartum period. Then discuss whether or not it should be considered the fourth trimester.

Handout 12 (RP 1)

Heritability of Height

The purpose of this project is to demonstrate the concept of heritability by using height. You will do a kinship study of two families (one of the families can be your own) to collect the necessary data. Record the height of all family members over 18 years of age, and separate them by sex. Calculate the mean and range of heights of both sexes for both families and compare them. This exercise is intended to give you experience both with a kinship study design and with the concept of heritability for a variable with a clear operational definition. Use the following data sheet to record heights. Then answer the questions below.

Person/Sex	Family 1	Family 2	Data	Family 1	Family 2
Self	_____	_____	Average female	_____	_____
Mother	_____	_____	Average male	_____	_____
Father	_____	_____	Tallest female	_____	_____
Grandmother 1	_____	_____	Tallest male	_____	_____
Grandmother 2	_____	_____	Shortest female	_____	_____
Grandfather 1	_____	_____	Shortest male	_____	_____
Grandfather 2	_____	_____			
Sibling	_____	_____			
Sibling	_____	_____			
Sibling	_____	_____			
Aunt	_____	_____			
Aunt	_____	_____			
Aunt	_____	_____			
Uncle	_____	_____			
Uncle	_____	_____			
Uncle	_____	_____			
Cousin	_____	_____			
Cousin	_____	_____			
Cousin	_____	_____			
Cousin	_____	_____			
Other	_____	_____			
Other	_____	_____			
Other	_____	_____			

Questions:

- Which family in your sample is, on average, taller (for both males and females)?
- Of the taller family, how many females are taller than the females in the shorter family? How many of the males are taller than the males in the shorter family?
- From your data, does it appear that height is an inherited trait?
- What is the advantage of examining the heritability of a variable like height rather than a variable such as temperament or intelligence?

Genetic Counseling Available to You

Chapter 2 introduces the concept of genetic counseling, and how genetic counseling can help expectant parents learn about the possibility that their infants will suffer from genetically based problems. While the focus in the text is on the process of counseling, it does not say much about how this service is delivered from community to community.

For this project, you will find out and report if genetic counseling services are made available in your community. You will want to discuss where one can go for these services in your community, as well as how people can find out about genetic counseling services. Form groups of up to four individuals, and divide the following tasks between individuals or pairs. Contact hospitals to learn whether they disseminate information about genetic counseling, and, if they do, obtain the pamphlets or handouts that they provide. If there are other services or organizations for expectant parents (e.g., Planned Parenthood or divisions of social service agencies), find out what they offer. If you can identify individuals in the community who provide such information, contact them to see if they will allow you to interview them about their services. Go to the public library and look up books or other reference materials about genetic counseling.

Once you have determined what information is publicly available, write a report that summarizes the information that you obtained. In addition, address the following questions:

- How current is the information?
- What source of information is most easily and cheaply available?
- What attitude does the material seem to take toward genetic counseling?
- Are parents able to make their own decisions about their infants' chances of suffering a genetic defect with the information they obtain from genetic counselors in your community?
- What options or alternatives are available in your community?
- Are any alternatives discouraged by the genetic counselors?
- Are the services uniformly available to all community members?
- Are there significant controversies about their use?
- What political/ethical/legal issues did you discover?

Handout 14 (RP 3)

Why Do Some Pregnant Women Drink, Smoke, or Use Drugs?

The dangers of drinking alcohol, smoking, and other drug use on fetal development are now well known and widely publicized. Despite this fact, many women continue to use these substances while they are pregnant. This research activity attempts to find out why.

Ask a number of female friends who smoke and/or drink to talk to you about how a future pregnancy may affect these behaviors. Determine what your friends know about the effects of smoking and drinking on prenatal development. Then talk about the dangers, and ask again whether your friends will smoke and/or drink during pregnancy. Before meeting with your friends, you may want to prepare an interview schedule of about ten questions to ask. Be sure to avoid judgmental statements/questions. Interview each woman individually, so her answers will be confidential.

Fatherhood

How actively are fathers participating in the births of their children these days? Find out by carrying out an interview project. Identify two first-time, expectant fathers and two fathers of children under the age of 2, and interview these men using the following sets of questions:

Expectant Fathers:

- What are your feelings about becoming a father?
- How have you been involved in your partner's pregnancy?
- What part will you play in your child's birth? What part would you like to play?
- What do you think being a "good father" means?
- How will having a child change your life?

Fathers:

- What part did you play in the birth(s) of your child (children)? What were your feelings about this experience?
- What are the three biggest challenges you face as a father?
- What do you think a "good father" is?
- How has having a child changed your life?
- What advice would you give a new father?

Write a brief report in which you 1) indicate what you were trying to find out, 2) describe your sample and how you interviewed the fathers and soon-to-be fathers, and 3) summarize similarities and differences between the two pairs of men. Relate what you learn to material from the textbook on fathers' participation in childbirth.