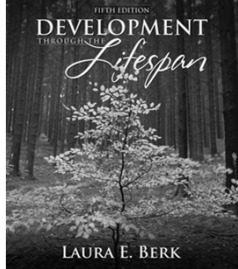


# Development Through the Lifespan



## Chapter 2 Biological and Environmental Foundations

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## Genotypes and Phenotypes

### Genotype

Genetic make-up  
of an individual

### Phenotype

Observable  
characteristics of  
an individual



Absolute Family

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## Genetic Foundations



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Chromosomes –  
store and transmit  
genetic information

Genes – segments of  
DNA located along  
the chromosomes

DNA – substance of  
which genes and  
chromosomes are  
made

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## DNA and Mitosis

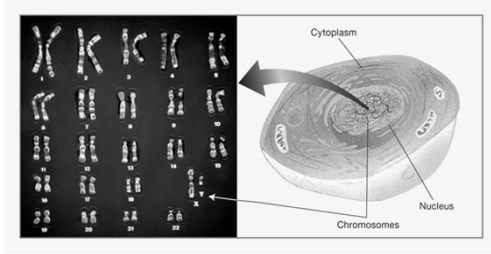


Figure 2.1

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## Chromosomes, Cells, and Sex: Terminology

|                 |  |
|-----------------|--|
| Autosomes       | The 22 pairs of chromosomes that are <i>not</i> sex chromosomes  |
| Sex Chromosomes | <ul style="list-style-type: none"> <li>• 23rd pair of chromosomes</li> <li>• Determines sex</li> <li>• XX = female, XY = male</li> </ul> |
| Gametes         | Sex cells: sperm and ova   |
| Zygote          | Sperm and ovum united  |

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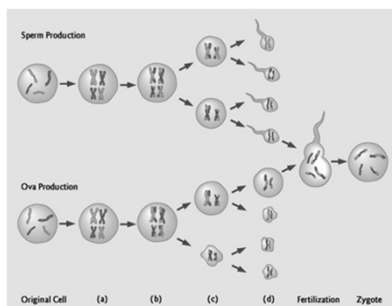
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## Meiosis



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## Twins

### Fraternal/Dizygotic

- two zygotes, or fertilized ova

### Identical/Monozygotic

- one zygote that divides into two individuals



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## Alleles

### Two forms of the same gene

- appear at the same place on both chromosomes in a pair
- one inherited from each parent
- homozygous—the two alleles are alike
- heterozygous—the alleles differ

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## Dominant-Recessive Inheritance

- Dominant–recessive pattern
  - Dominant genes always express their characteristics
  - Recessive genes come in pairs to express their characteristics

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## Dominant-Recessive Inheritance

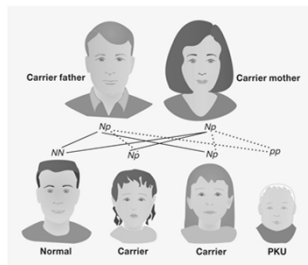


Figure 2.3

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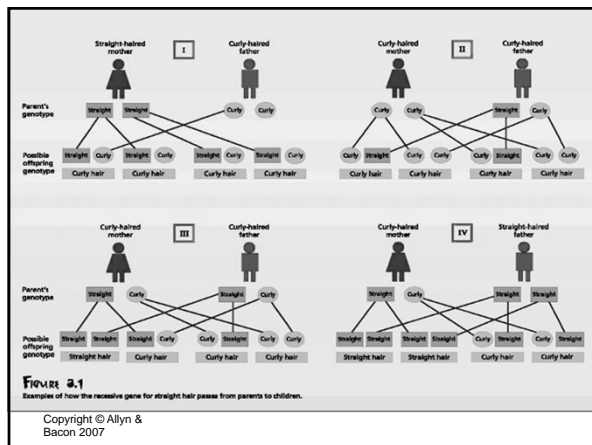
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**FIGURE 3.1**  
Examples of how the recessive gene for straight hair passes from parents to children.

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## X-Linked Inheritance

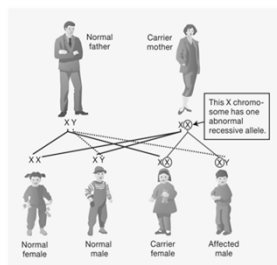


Figure 2.4

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## Incomplete Dominance and Polygenetic Inheritance

### Incomplete Dominance

Both alleles of a single gene are expressed.

Results in

- combined trait or
- intermediate between the two

### Polygenic Inheritance

Many genes combine to influence a trait.

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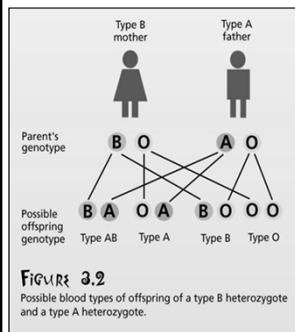
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## Conception and Genetics



### Polygenic Inheritance

- Many genes blend together to increase the genetic outcomes seen in the phenotype

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## Genomic Imprinting and Mutation

### Imprinting

Chemical marker that activates either father's or mother's gene  
Often temporary

### Mutation

Sudden, permanent change in a DNA segment

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## Chromosomal Abnormalities

### Down Syndrome

- problems with the twenty-first chromosome

### Sex chromosome abnormalities

- problems with the X or Y chromosomes



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## Reproductive Choices



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Genetic counseling  
Genetic testing  
Prenatal diagnosis  
and fetal medicine  
Adoption

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## Reproductive Technologies

- Donor insemination
- In vitro fertilization
- Surrogate mother
- New technologies



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## Genetic Counseling

Helps couples:

- assess chances of hereditary disorders
- choose best course of action
  - risks
  - family goals

Recommended when:

- couple has had difficulties
- aware of genetic problems
- woman is over 35



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## Prenatal Diagnostic Methods

- Amniocentesis
- Chorionic villus sampling
- Fetoscopy
- Ultrasound
- Maternal blood analysis
- Preimplantation genetic diagnosis



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## Amniocentesis and Chorionic Villus Sampling

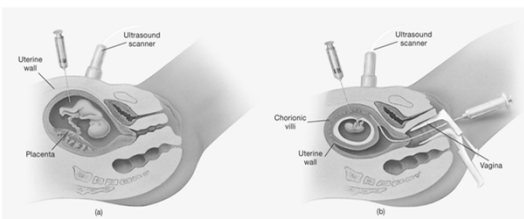


Figure 2.5

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## Adoption

### Trends

- international adoption
- older children
- developmental issues

Exhibit some difficulties

Most fare well



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## Environmental Contexts for Development



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- Family
- Socioeconomic status and family functioning
- Affluence
- Poverty
- Neighborhoods, towns, and cities
- Cultural context

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## Family Influences on Development

### Direct

- two-person relationships

### Indirect

- third parties

### Adapting to change

- changes from within and outside the family



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## Socioeconomic Status (SES)

### Social status

- years of education
- job prestige and skill required

### Economic status

- income



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## Socioeconomic Status and Family Functioning

- Timing and duration of family life cycle
- Values and expectations
- Education, status of women
- Communication and discipline styles
- Children's cognitive development



Family Life

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## Risks of Affluence

Alcohol and drug use

Anxiety

Depression



Modern Teen

### Unavailable parents

- overscheduled
- demanding

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## The Importance of Regularly Eating Dinner as a Family

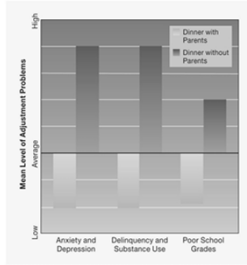


Figure 2.6

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## Who Is Poor?

12.5% in United States

- parents under age 25 with young children
- elderly living alone, especially women
- ethnic minorities
- women
- children



Senior Lifestyles

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## Homelessness

23% of homeless are families with children

- majority with children under age 5
- poor school attendance
- health issues
- developmental delays

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## Benefits of Strong Community Ties for Children and Adults

- Social interaction, activities
- Cooperation to provide clean, safe environment
- Participation in important tasks
- Mutual assistance



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## Extended Families

Three or more generations living together

More common in many minority cultures

Benefits

- reduces stress of poverty
- assistance for all generations
- emotional bonds, support



Senior Lifestyles

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## Individualist and Collectivist Societies

### Individualist

People define themselves as separate from other people.

Largely concerned with personal needs and goals.

### Collectivist

People define themselves as part of a group.

Stress group goals over individual goals.

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## Indicators of Children's Health and Well-Being

| INDICATOR   | U.S. RANK* | SOME COUNTRIES THE UNITED STATES TRAILS   |
|---|------------|---|
| Childhood poverty (among 25 industrialized nations considered)  | 25th       | Canada, Czech Republic, Germany, Norway, Sweden, Poland, Spain <sup>b</sup>           |
| Infant deaths in the first year of life (worldwide)   | 26th       | Canada, Hong Kong, Ireland, Singapore, Spain  |
| Teenage birth rate (among 28 industrialized nations considered)   | 28th       | Australia, Canada, Czech Republic, Denmark, Hungary, Iceland, Poland, Slovak Republic |
| Public expenditures on education as percentage of gross domestic product <sup>c</sup> (among 22 industrialized nations considered)                                  | 12th       | Belgium, France, Iceland, New Zealand, Portugal, Spain, Sweden                        |
| Public expenditures on early childhood education and child care as a percentage of gross domestic product <sup>c</sup> (among 14 industrialized nations considered) | 9th        | Austria, Germany, Italy, Netherlands, France, Sweden                                  |
| Public expenditures on health as a percentage of gross domestic product (among 22 industrialized nations considered)  | 16th       | Austria, Australia, Canada, France, Hungary, Iceland, Switzerland, New Zealand        |

Table 2.5

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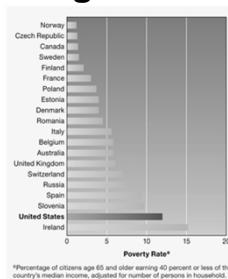
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## Percentage of Elderly Living in Poverty



\*Percentage of citizens age 65 and older earning 40 percent or less of the country's median income, adjusted for number of persons in household.

Figure 2.7

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## How Much Does Heredity Contribute to Behavior?

### Heritability Estimates

Portion of individual differences attributable to genetics

Ranges from 0 to 1.00

### Kinship Studies

What percent of the time do family members/twins show a trait?

Ranges from 0 to 100%

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## Range of Reaction

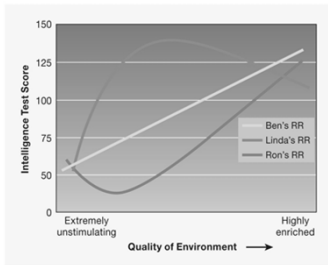


Figure 2.8

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## Genetic-Environment Correlation

- Passive correlation
- Evocative correlation
- Active correlation
  - niche-picking



Absolute Family

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## Evocative Genetic-Environmental Correlation

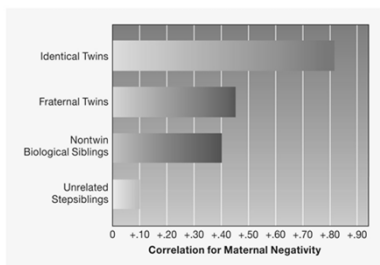


Figure 2.9

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## The Epigenetic Framework

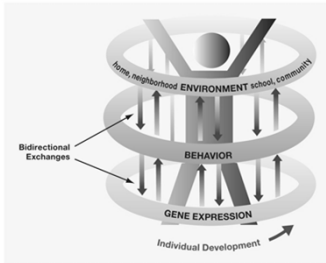


Figure 2.10

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