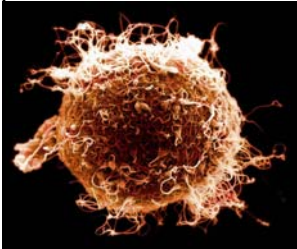


Lifespan Psychology



Chapter 3 Biology of Development

1

Outline



- ◆ **Infertility/Reproductive technologies**
 - Probabilities
 - Fertility problems and treatments
 - Legal and ethical issues
 - Adoption
- ◆ **Heredity/DNA/Genes**


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Infertility



- ◆ **probabilities of fertilization - birth**
- ◆ **affects many American couples**
- ◆ **1 in 10 to about 1 in 6 (10-17%)**
- ◆ **women - most commonly blockage or abnormality of fallopian tubes**
- ◆ **men - low sperm count or low sperm motility**


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Medical technologies

- ♦ test tube baby (in vitro fertilization)
- ♦ common procedure now
- ♦ in use for over two decades
- ♦ US first in 1981, now over 250,000 babies born
- ♦ no guarantee of success, overall about 29%/egg retrieval

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Other medical options

- ♦ Fertility drugs
 - stimulate maturation/release of eggs
 - stimulate "normal" ovulation
 - drugs can develop/maintain the uterine lining
- ♦ fertility drugs = increased p(multiple births)
- ♦ artificial insemination
- ♦ surrogate mothers

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Issues with reproductive technologies

- ♦ advantages and disadvantages?
- ♦ ethical issues?
- ♦ law
- ♦ ownership of embryos?
- ♦ rights/obligations of "other parent?"
- ♦ very expensive
- ♦ who pays?

- ♦ adoption trends


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Functions of genes

- ◆ direct "housekeeping" chores
- ◆ metabolic functions
- ◆ few hundred carry codes for proteins only for that type of cell
- ◆ Twins
 - monozygotic
 - dizygotic
 - genetic relatedness of MZ and DZ twins?


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Genetic Inheritance

- ◆ Gregor Mendel (1822-1884)
- ◆ discovery in the 1860's
- ◆ ignored until "rediscovered" around 1900
- ◆ Heredity transmitted in discrete units
 - not via "blending" mom and dad's traits
 - children resemble their parents
 - attributed to "blending of bloods"
 - origin of "bloodlines" & "in the blood"


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Mendel's work

- ◆ pea plants
- ◆ traits that came in pairs of alleles
- ◆ simple pairs of traits.
- ◆ tall vs. short; purple vs. white flowers; wrinkled vs. smooth peas
- ◆ offspring always one or the other


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Cross breeding

- ◆ a short and a tall plant, where:
- ◆ both parents the same as their parents
- ◆ 100% tall plants
- ◆ two of these tall offspring
- ◆ 75% tall and 25% short plants (roughly)


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Mendel concluded (correctly)

- ◆ each parent carries 2 units of heredity governing each trait
- ◆ sex cells only carry one unit of heredity each; sperm and egg each contribute one unit to pair
- ◆ when combined in offspring, one may dominate the other


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In the pea plant

- ◆ "tall" genes dominate "short"
- ◆ 1 tall and 1 short gene = no blending
- ◆ the plant grows tall
- ◆ short or second gene doesn't matter

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Genetics continued


- ◆ **Recessive genes**
 - can emerge to take control in subsequent generations
 - dominant - recessive status of human characteristics
- ◆ **Genotype and Phenotype**
 - **Genotype:** Set of genes a person inherits
 - **Phenotype:** Set of traits a person actually displays

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Risk of Selected Genetic Disorders

Chromosomal	
Down Syndrome	1/800
Klinefelter syndrome (XXY)	1/800 men
Fragile X syndrome	1/1,200 male births
Turner syndrome (XO)	1/2,000 female births
Turner syndrome (XO)	1/3,000 women
Dominant Gene	
Polydactyly	1/300 - 1/100
Achondroplasia	1/2,300
Huntington disease	1/15,000 - 1/5,000
Recessive Gene	
Cystic fibrosis	1/2,500 white persons (risk of being a carrier is 1/25)
Sickle-cell disease	1/625 African Americans (risk of being a carrier is 1/10)
Tay-Sachs disease	1/3,600 Eastern European Jews (risk of being a carrier is 1/30 - 1/300)
X Linked	
Hemophilia	1/2,500 male babies
Multifactorial	
Congenital heart disease	1/125
Neural tube defect	1 - 2/1,000
Cleft lip/cleft palate	1/1,000 - 1/5,000


Sources: ACOG (1990); Blatt (1988); Diamond (1989); Hagerman (1996); Selekmán (1993); Stratford (1994).



Inheritance of a Dominant Gene Disorder

		Affected Parent (Has the Disorder)	
		D	r
Normal Father	r	Dr Affected (25%)	rr normal (25%)
	r	Dr Affected (25%)	rr normal (25%)
		(50%)	(50%)

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Inheritance of a Recessive Gene Disorder

Carrier Mother
D r

Carrier Father
D r

D	DD Normal (25%)	Dr Normal (25%)
r	Dr Normal (25%)	rr Affected (25%)

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Inheritance of Hemophilia, a Sex-Linked Disorder

Carrier Mother
X X

Normal Father
X Y

X	XX Normal Daughter (25%)	XX Carrier Daughter (25%)
Y	XY Normal Son (25%)	XY Hemophilic Son (25%)

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