

Gender Dimorphism

Lecture 35

Aspects of Gender Dimorphism



- Biological Sex
- Gender Identity
 - Gender Role
- Sexual Orientation



The Human Genome



National Geographic

Caster Semenya

Gold Medal, 800m Race

World Track and Field Championships, Berlin, 2009

“She can decide to run
as a woman, which
she is.”

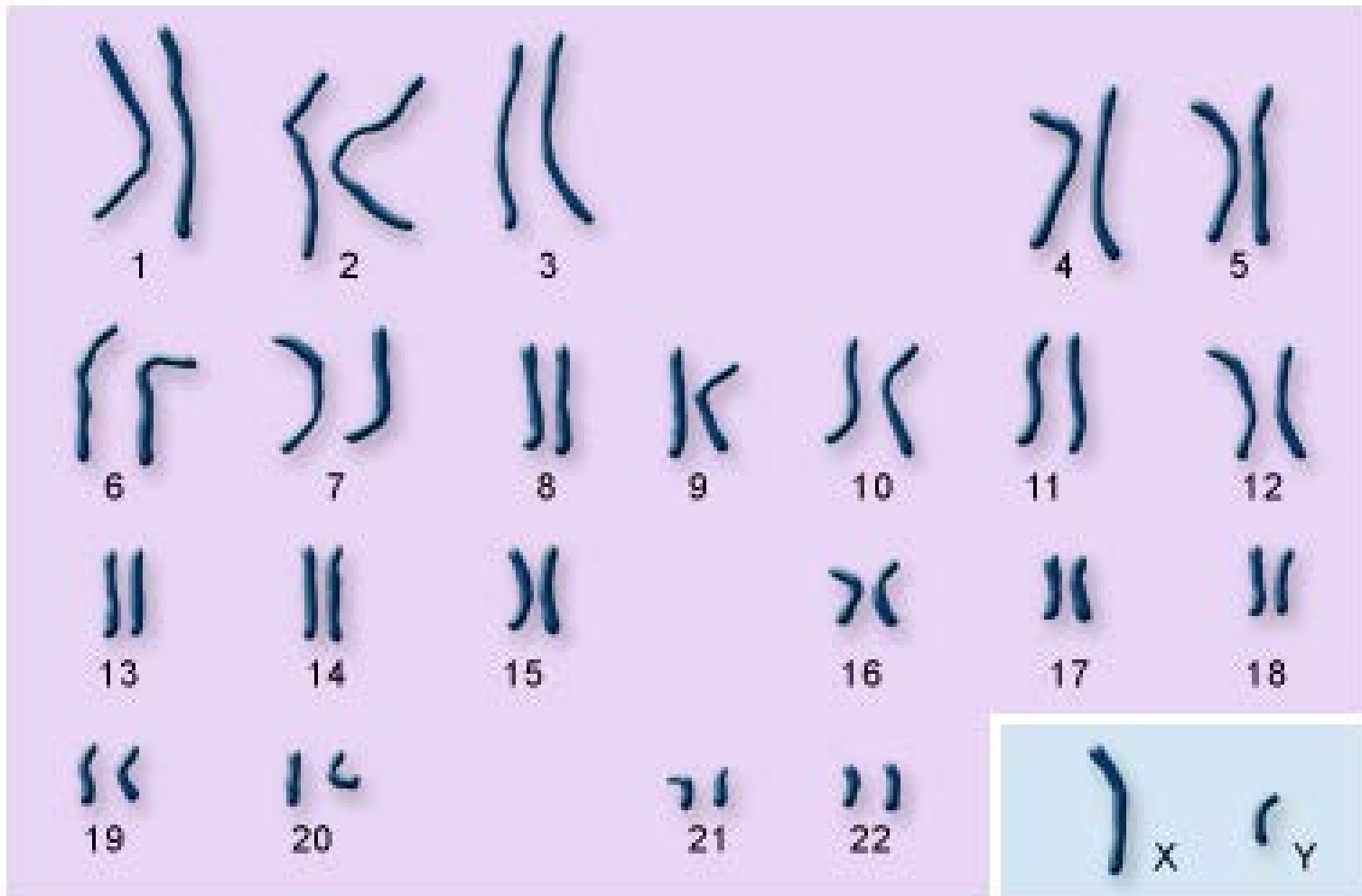
Makhenkesi Stofile
New York Times, 11/20/2009

“[She] is going to
compete as a woman
and will remain a
woman until she dies”

Michael Seme
New York Times, 11/20/2009



The Human Genome

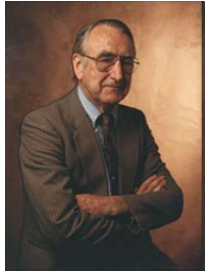


autosomes

sex chromosomes

The Program for Gender Dimorphism

Money & Ehrhardt (1972)



The program for gender dimorphism passes from the genes and the hormones to the child's autobiographical history and thereafter is continually exchanged between the biological and the social environment

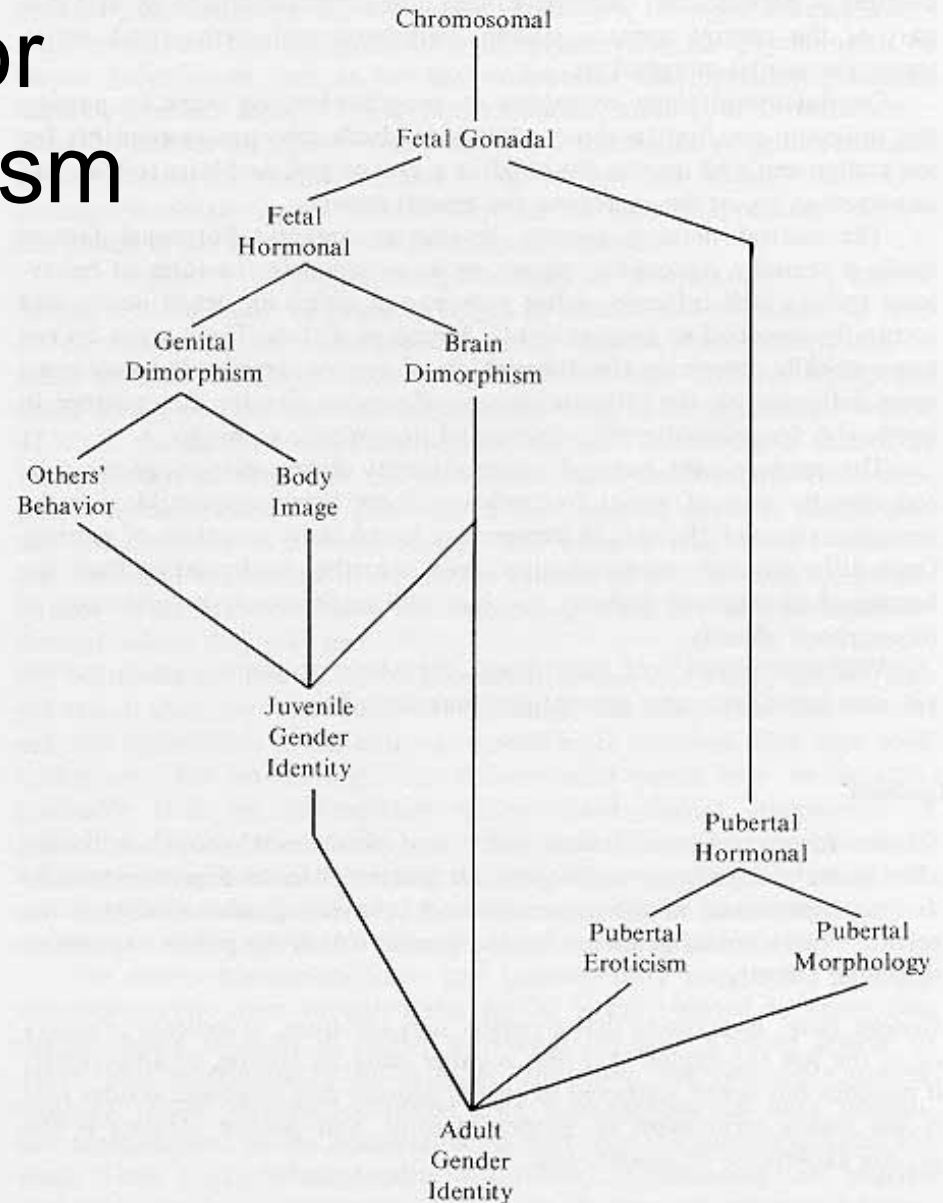
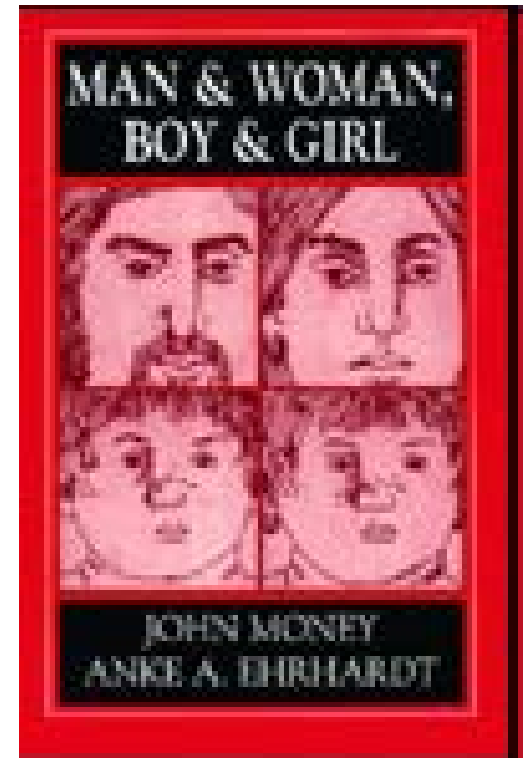


Figure 1.1. Diagram to illustrate the sequential and interactional components of gender-identity differentiation.

The Imperatives of Gender

Money & Ehrhardt (1972)

- Phyletic Imprimatur
- Social Imprimatur
- Procreative Imperatives
 - Menstruation
 - Gestation
 - Lactation
 - Impregnation



Undifferentiated Gonadal Tissue

Primordial Structure (Anlagen)

Money & Ehrhardt (1972)

Outer Cortex: Ovaries

Inner Medulla: Testes

Mullerian Ducts: Female Internal Organs

Uterus, Fallopian Tubes, Inner Vagina

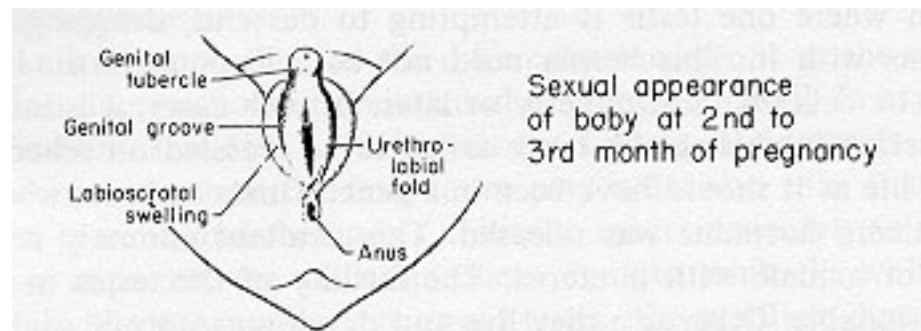
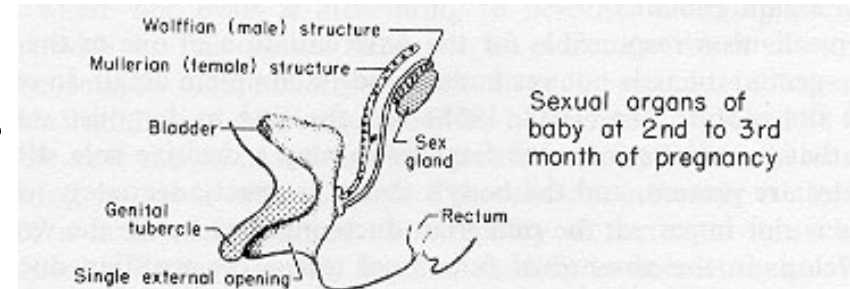
Wolffian Ducts: Male Internal Organs

Vas Deferens, Seminal Vesicles, Ejaculatory Ducts

External Genitalia

Genital Tubercle, Urogenital Slit, Urethral Folds, Labio-Scrotal Swellings

Clitoris/Vagina, Penis/Scrotum



“Nature’s Rule”: Add Something to Masculinize

Money & Ehrhardt (1972)

SEXUAL DIFFERENTIATION IN THE HUMAN FETUS

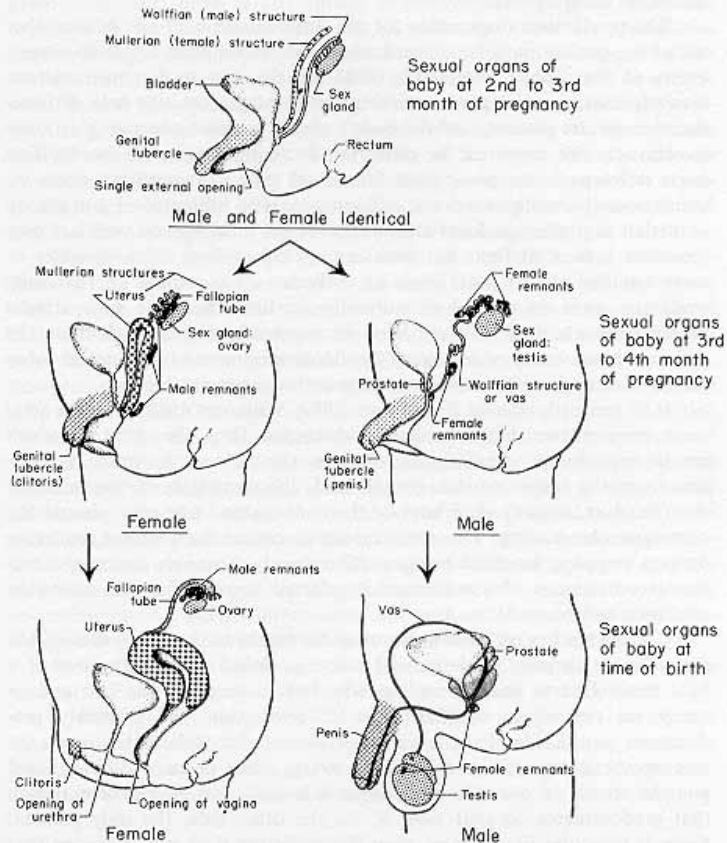


Figure 3.1. Three stages in the differentiation of the sexual system, internal and external. Note the early parallelism of the mullerian and wolffian ducts, with the ultimate vestigation of one and the development of the other.

EXTERNAL GENITAL DIFFERENTIATION IN THE HUMAN FETUS

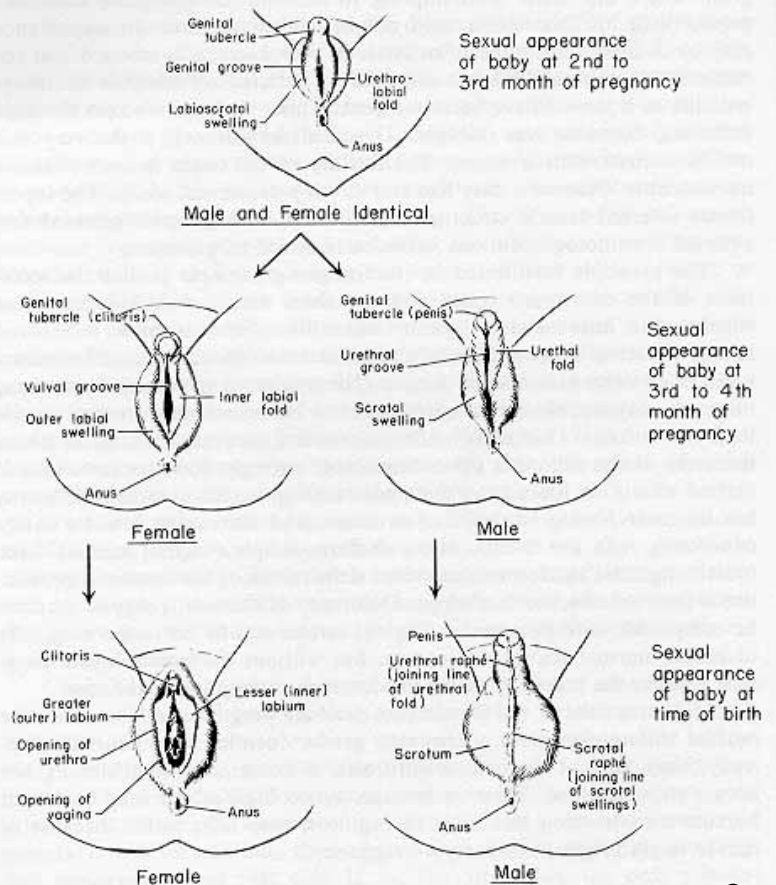


Figure 3.2. Three stages in the differentiation of the external genital organs. The male and the female organs have the same beginnings and are homologous with one another.

Outcome of Fetal Gender Differentiation

Male Reproductive Anatomy

- Internal
 - Testes
 - Vas Deferens
 - Seminal Vesicles
 - Ejaculatory Ducts
- External
 - Penis
 - Scrotum

Female Reproductive Anatomy

- Internal
 - Ovaries
 - Uterus
 - Fallopian Tubes
- External
 - Clitoris
 - Vagina

Pseudohermaphroditism

- Chromosomal XX
 - Female Adrenogenital Syndrome
 - Progestin-Induced Pseudohermaphroditism
- Chromosomal XY
 - Failure of Mullerian-Inhibiting Substance
 - Androgen-Insensitivity Syndrome
 - Klinefelter's Syndrome: 47XXY
 - *Guevodoces*
 - *5- α -Reductase Deficiency Syndrome*

Pseudohermaphroditism in Genetic Females (XX)

- Female Adrenogenital Syndrome
 - Circulation of Androgen to Fetus
 - Masculinization of External Genitalia
 - No Effects on Internal Genitalia
 - Surgical Correction, Cortisone Therapy
- Progestin-Induced Pseudohermaphroditism
 - Synthetic Hormones to Prevent Miscarriage
 - Masculinization of External Genitalia
 - No Effects on Internal Genitalia
 - Surgical Correction, No Need for Cortisone

Pseudohermaphroditism in Genetic Males (XY)

- Failure of Mullerian-Inhibiting Substance
 - Male and Female Internal Reproductive System
 - Masculine External Genitalia
 - Raised as Boys
- Androgen-Insensitivity Syndrome
 - Failure to Masculinize External Genitalia
 - Surgical Correction
 - Typically Raised as Girls
 - Natural Estrogen Feminizes Physique
 - Do Not Menstruate; Infertile

Pseudohermaphroditism in Genetic Males (XY)

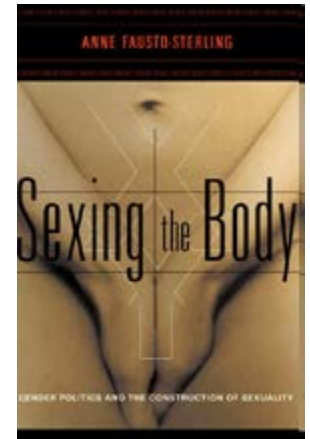
- Klinefelter's Syndrome: 47XXY
 - Feminized Physique, Infertility
 - Hormone Therapy to Replace Testosterone
- *Guevodoces*
 - 5- α -Reductase Deficiency Syndrome
 - Apparently Female External Genitalia
 - Raised as Girls
 - Masculinization at Puberty
 - Recognized as Boys

The Five Sexes... And More?

Anne Fausto-Sterling (1985, 1992, 2000); Sax (2002)



- Male
- Female
- “Intersex” (c. 0.2% of Population)
 - Pseudohermaphrodites
 - XY, Female Anatomy
 - XX, Male Anatomy
 - “True” Hermaphrodites



Psychosocial Consequences of Pseudohermaphroditism in Genetic Females (XX)

Female Adrenogenital Syndrome

Progestin-Induced Pseudohermaphroditism

- Identified, Raised as Girls
 - Surgical Correction of External Genitalia
- Develop Feminine Physical Features
 - Cortisone Therapy Needed in FAS
- Adopt Feminine Gender Identity, Role

Psychosocial Consequences of Pseudohermaphroditism in Genetic Males (XY)

- **Failure of the Mullerian-Inhibiting Substance**
 - Male External Genitalia
 - Female Internal Reproductive Anatomy Surgically Removed
 - Identified and Raised as Boys
 - Identify Selves as Boys
- **Androgen-Insensitivity Syndrome**
 - No Masculinization of Reproductive Anatomy
 - Testes Surgically Removed
 - Raised as Girls, Identify Themselves as Girls
 - No Menstruation at Puberty

Psychosocial Consequences of Pseudohermaphroditism in Genetic Males (XY)

- **Klinefelter's Syndrome (47, XXY)**
 - Male External Genitalia
 - Feminized Physique
 - Identified and Raised as Boys
 - Identify Selves as Boys
- ***Guevodoces***
 - Initially Identified and Raised as Girls
 - Shift Gender Identity at Puberty
 - Masculine Gender Role in Adolescence/Adulthood
 - Heterosexual Erotic Orientation

“Masculinization of the Brain”?

- **Female Adrenogenital Syndrome (XX)**
 - Also Progestin-Induced Pseudohermaphroditism
 - Genetic Females Raised as Girls
 - More “Tomboyish” Than Average Girl
- **Androgen Insensitivity Syndrome (XY)**
 - Genetic Males Raised as Girls
 - Behavior the Same as “Normal” Girls
- **Exogenous Estrogen, Progesterone (XY)**
 - No Effects on Reproductive Anatomy
 - Less Aggressive, Competitive than Controls?
 - Artifact of Illness in Family?

Program for Gender Dimorphism

Money & Ehrhardt
(1972)

- Phyletic Imprimatur

- Social Imprimatur

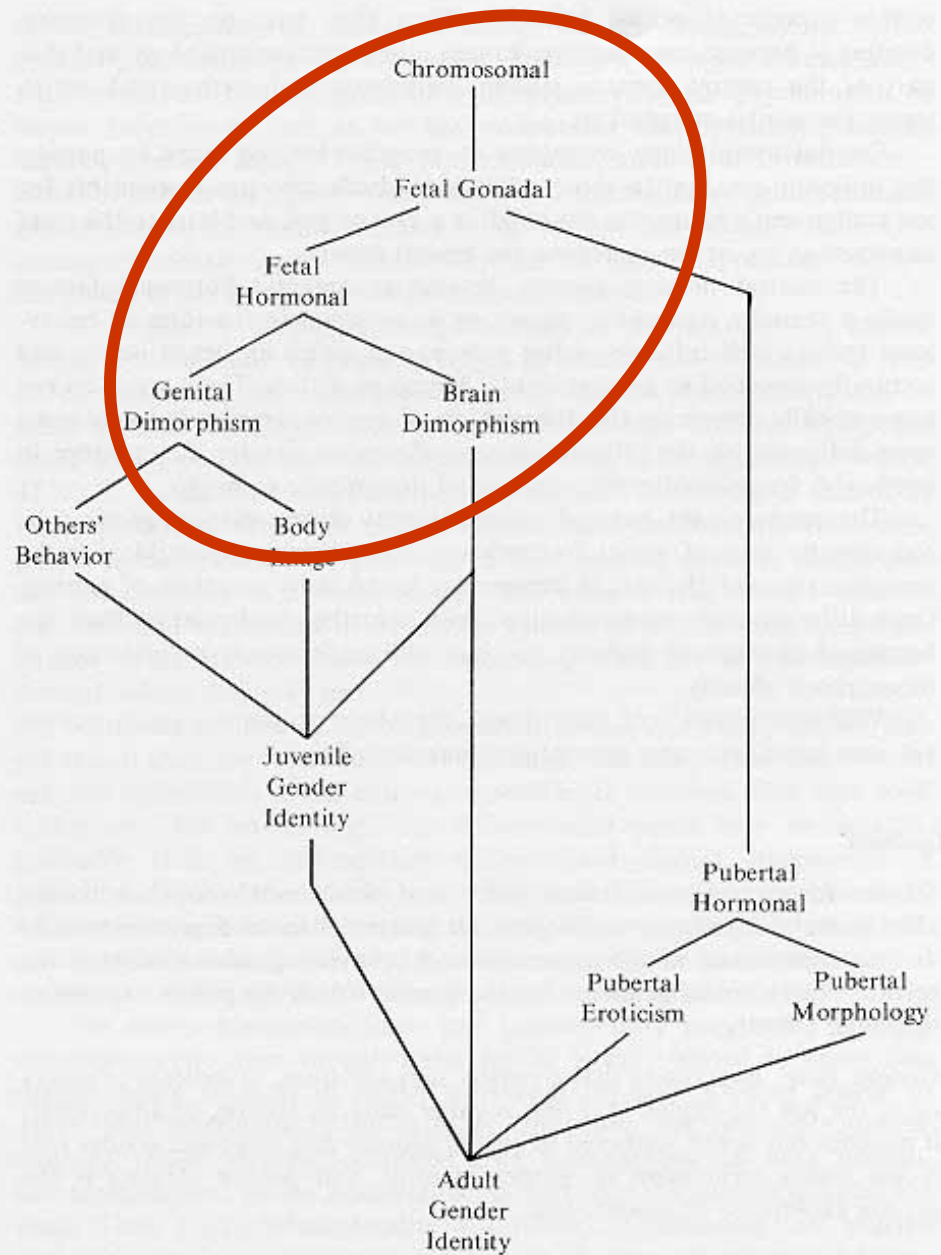


Figure 1.1. Diagram to illustrate the sequential and interactional components of gender-identity differentiation.

Gender Differentiation: The Social Imprimatur

Money & Ehrhardt (1972)

- Biographical History
- Gender-Role Socialization
 - Cultural Concepts of Masculinity, Femininity
- Development of Self-Concept
- Social Learning
 - Direct Experience
 - Precept
 - Example

Gender Dimorphism Beyond Reproductive Anatomy

- Gender Identity
 - Male, Female
 - Transgendered
- Gender Role
 - Masculine
 - Feminine
- Erotic Orientation
 - Heterosexual, Homosexual
 - Bisexual, Asexual



Former New York Mayor Rudolf Giuliani, dressing in drag at the Inner Circle celebrity roast, 1997.



Julie Andrews as a woman playing a cross-dressing man, in the film *Victor Victoria*, 1982.

Gender-Role Dimorphism

Constantinople (1973); Bem (1974); Spence et al (1975); Heilbrun (1976)

Stereotypically Masculine

Agency

Instrumentality

- Decision-Making
- Independence
- Active
- Leadership
- Competitiveness
- Provider Role
- Achievement Outside Family

Stereotypically Feminine

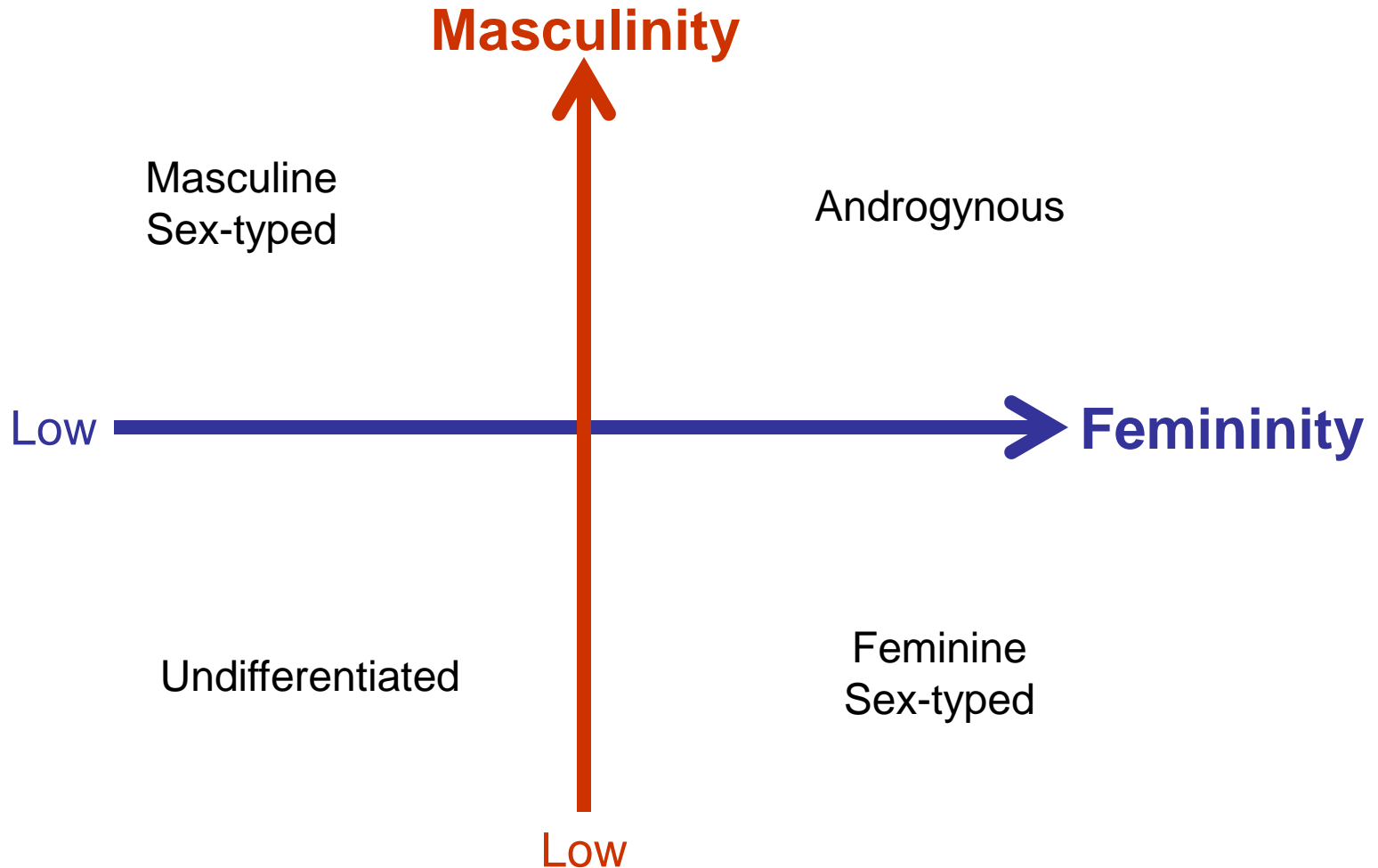
Communality

Expressiveness

- Sensitivity
- Emotionality
- Kindness, Empathy
- Concern for Others
- Interpersonal Harmony
- Caring Orientation
- Nurturance
- Achievement Inside Family

Psychological Androgyny

Constantinople (1973) Bem (1974); Spence et al (1975); Heilbrun (1976)



Twin Study of Gender Role

Dworkin et al. (1976), after Gottesman (1965, 1966)

		<u>MZ</u>	<u>DZ</u>
MMPI <i>Mf</i>	Adolescents	.38	.22
	Adults	.46	.27
CPI <i>Fe</i>	Adolescents	.45	.34
	Adults	.47	.34

Components of Variance in Gender Role

After Dworkin et al. (1976), Gottesman (1965, 1966)

		<u>G</u>	<u>E_S</u>	<u>E_{NS}</u>
MMPI <i>Mf</i>	Adolescents	.32	.06	.62
	Adults	.38	.08	.54
CPI <i>Fe</i>	Adolescents	.22	.23	.55
	Adults	.26	.21	.53

Twin Study of Gender Role

American Subjects from Loehlin et al. (2005)

		<u>MZ</u>	<u>DZ</u>
Elderly	Males	.38	.22
	Females	.46	.27
High School 1	Males	.45	.34
	Females	.47	.34
High School 2	Males	.30	.20
	Females	.46	.22

Components of Variance in Gender Role

American Subjects in Loehlin et al. (2005)

	<u>G</u>	<u>E_S</u>	<u>E_{NS}</u>
Elderly	.36	.08	.56
High School 1	.28	.18	.54
High School 2 Males	.25	.00	.76
Females	.38	.00	.62

The Social Imprimatur in Gender Dimorphism

- Recognition of Child's Biological Sex
 - Identification, Categorization
 - Self-Identification
- Gender Socialization by Parents
 - Model Behavior
 - Communicate Expectations
 - Reward Performance
- Gender Socialization by Others
 - Peers, Teachers
 - Media

Child-Rearing Practices

Maccoby & Jacklin (1974); Maccoby (1998)



- Furnishing of Rooms
- Household Chores
- Differential Rewards, Punishments
- Differential Modeling
- Differential Socialization Outside Home

Barbie and G.I. Joe

Amazon.com: Toys / Brands / Barbie / Barbie Dolls

http://www.amazon.com/exec/obidos/tg/browse/-/barbie/171473/002-6201112-9277620

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Barbie

Toys > Brands > Barbie > Barbie Dolls


 <p>Magical Mermaid Barbie and Krissy by Mattel List Price: \$24.99 Our Price: \$21.99 You Save: \$3.00 (12%) More information</p>	 <p>Barbie Rock 'n Roll Radio House by Mattel List Price: \$34.99 Our Price: \$29.99 You Save: \$5.00 (14%) More information</p>	 <p>Jewel Girl Barbie by Mattel List Price: \$13.99 Our Price: \$11.99 You Save: \$2.00 (14%) More information</p>	 <p>Secret Messages Barbie by Mattel Our Price: \$8.97 More information</p>
 <p>Swimming Champion Barbie by Mattel Our Price: \$14.99 More information</p>	 <p>Super Gymnast Barbie Doll by Mattel List Price: \$24.99 Our Price: \$12.49 You Save: \$12.50 (50%) More information</p>	 <p>Celebration Cake Barbie Doll by Mattel Our Price: \$9.97 More information</p>	 <p>Princess Barbie Doll by Mattel Our Price: \$9.99 More information</p>

Search: Toys & Games Shop by Age: Birth


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G.I. Joe Classic Figures 2000 Delta: Marine Wardog by Hasbro
Our Price: \$24.99

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Usually ships in 24 hours
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G.I. Joe 155mm Howitzer by Hasbro
Our Price: \$49.99

Customer Fun Rating: ★★★★★
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G.I. Joe 35th Anniversary Then and Now Figures 2-pack by Hasbro
Our Price: \$49.99

Customer Fun Rating: ★★★★★
Usually ships in 24 hours
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Amazon.com recommended age: 5 years and up



“Gee,
Math Class
Is Hard!”
(1967)

Recognition of Gender

Maccoby & Jacklin (1974); Maccoby (1998)

- Age 2
 - Recognize Others
 - Gender Typing
 - Pronouns
 - Own Photograph
 - Positive Valence
 - Modeling
- Age 3
 - Object Preference

Development of Gender Role

Maccoby & Jacklin (1974); Maccoby (1998)

Before Age 2, Undifferentiated

Active Learning

Direct Experience

Observational Learning

- Entry to School
 - Playmate Preferences
 - Group Size
 - Roughhousing
 - Fighting
 - Resources
- Asymmetry
 - Taboo
 - Stringent Differentiation
 - Fathers vs. Mothers

Post-Natal Hormonal Influences

- Puberty

- Menarche
 - Arenarche
- Nocturnal Emissions
- Secondary Sex Characteristics



- Middle – Old Age

- Menopause
- Andropause?



“An Elderly Couple” by Jan Gossaert (1520)

- Partial Androgen Deficiency in Aging Men (“Low T”)

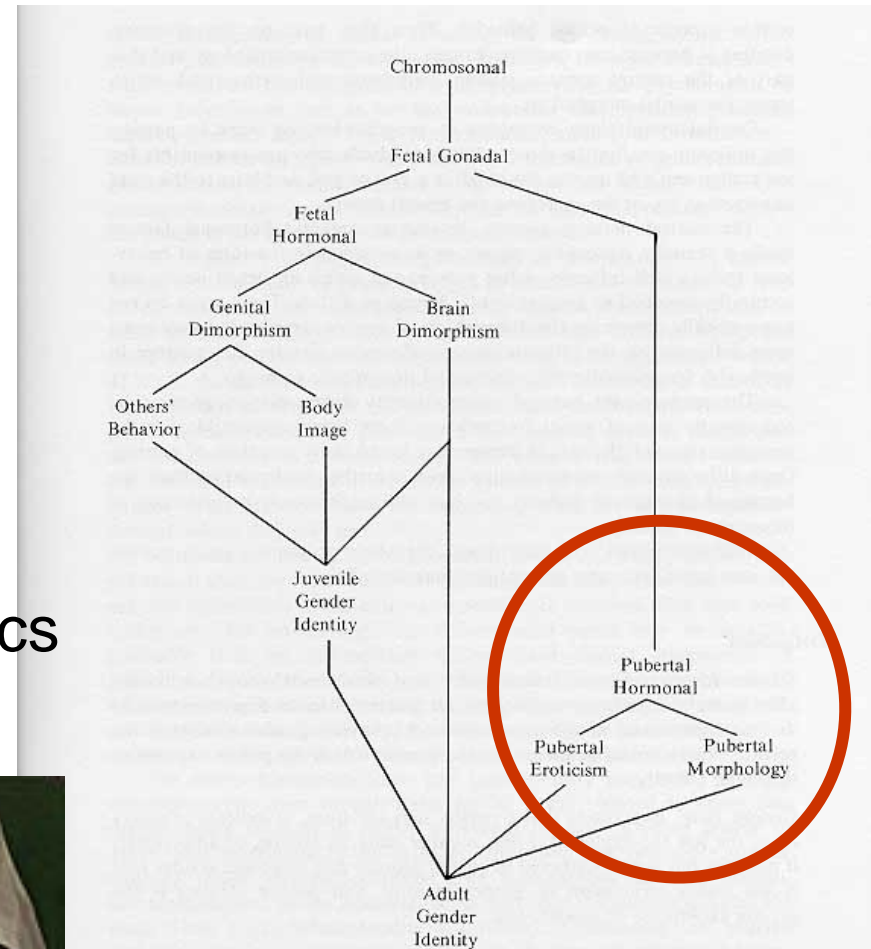
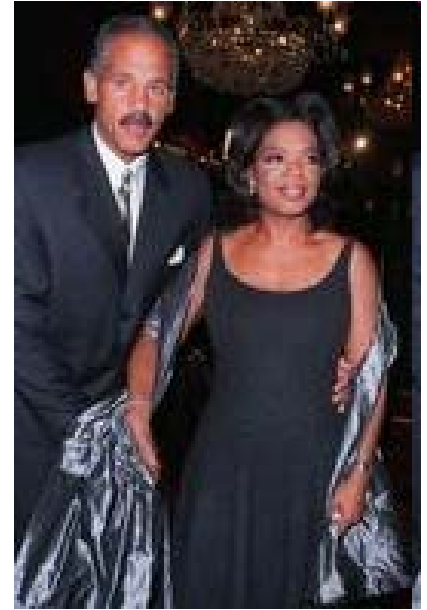


Figure 1.1. Diagram to illustrate the sequential and interactional components of gender-identity differentiation.

Aspects of Erotic Orientation

- Heterosexual
- Homosexual
 - Bisexual
 - Asexual



Twin Studies of Homosexuality

Meta-Analysis of 12 Studies by Bailey et al. (2016)



- Concordance Rates

- 5 “Targeted Studies”

- MZ = .52
 - DZ = .17

- 7 “Nontargeted Studies”

- MZ = .25
 - DZ = .13

- Median Estimate

- MZ = .24
 - DZ = .15

- Corrected for Baserate

- MZ = .57
 - DZ = .41

- Heritability Estimates
(Corrected for Baserate)

- $G = .32$
 - $E_S = .25$
 - $E_{NS} = .43$

320(+) Gender-Related Categories?

- Biological Sex
 - Male, Female
 - Intersex
 - Chromosomal XY
 - Chromosomal XX
 - “True” Hermaphrodite(?)
- Gender Identity
 - Male, Female
 - Transgender
 - Male, Female
- Gender Role
 - Masculine, Feminine
 - Androgynous
 - Undifferentiated
- Erotic Orientation
 - Heterosexual
 - Homosexual
 - Bisexual
 - Asexual