• It appears that children of mothers who experience severe stress while pregnant may have a higher rate of emotional problems and behavioral disorders
• Maternal stress may also be related to lower birth weight and impaired physiological functioning of the newborn

• **Helpful dietary supplements**
  - Folic acid
  - Calcium
  - Choline

• The birth experience
  - About 38 weeks after conception, the baby is ready to be born
  - **Uterine contractions** signal that birth is imminent
  - **Epidural**: pain medications for mothers during birth process
  - **Cesarean delivery**: deprives the fetus of the squeezing action of their head of a normal delivery, increasing the likelihood of its experiencing respiratory problems as a newborn

• Diversity of childbirth practices
  - Birth ceremonies differ by cultures
  - US vs. Bali
    - Balinese women allow all female relatives in the room to help her through her birth
    - Balinese women thus have more experience with birth
    - US women value physical health over family and community, not caring if they are in isolation during birth

• Appearance
  - **Appearance**: all blue, to head and chest pink, to all pink
  - **Pulse**: no pulse, <100/min, >100/min
  - **Grimace**: no expression, slight impression, crying impression
  - **Activity**: still, moving, moving a lot
  - **Respirations**: no respirations, weak/slow, strong cry

• The newborn infant
  - State of arousal
    - Arousal exists along a continuum from a deep sleep to intense activity
    - **Autostimulation theory**: infants spend a lot of time in REM (rapid eye movement; active sleep state assoc. w/dreaming) sleep to compensate for lack of external stimulation in womb
  - Crying
    - Infants cry for many reasons: happy, pain, illness, overstimulation
    - Peak period/time for crying: first 3 months, late afternoon or evening
    - Older babies cry as a communicative act to get adults to respond to them
    - How to soothe a crying infant
      - Rocking, lullabies, pacifier, holding baby up to shoulder
      - Combination works better than any of them alone
Range of reaction: an individual's genetic makeup establishes a range of possible developmental outcomes; environmental forces determine how the person actually develops.

Canalization: genetics restrict to a small number of outcomes, allowing only minor environmental influences.

Norm of reaction: genetic and environmental forces interact to create new phenotypes.
- It refers to all the phenotypes that could result from a given genotype.
  - PKU (phenylketonuria): prime example of how a given genotype combined with different environments can result in different phenotypes.
    - A disorder related to a defective recessive gene on chromosome 12 that prevents metabolism of phenylalanine.
  - Children are active sources of their own development in two ways:
    - They actively evoke certain responses from others.
    - Niche picking: they actively select surroundings and experiences combatable with their genetic predispositions.

Behavioral genetics:
- Phenotype = genetics + environment + (genetics x environment) + error.

Twin studies:
- Twin-study design compares the correlations for identical (monozygotic) twins with those for fraternal (dizygotic) twins.
  - Identical twins share 100% of same genetic material.
  - Fraternal twins and siblings share 50% of same genetic material.

Behavioral genetic research designs:
- Adoption studies look at adopted children in comparison to their biological parents and siblings and their adoptive ones.
  - Genetic influences are inferred when children resemble their biological relatives more than their adoptive ones.
  - Adoptive twin studies: identical twins who grew up together versus identical twins who grew up separated.

Family studies of intelligence:
- The most common subject in behavioral genetic family studies is intelligence.
  - These studies show the relative significance of genetics in intelligence by comparing correlations of identical twins, fraternal twins, siblings, and parents.

Environmental effects:
- Heritability estimates rarely exceed 50% indicating the large contribution of environmental factors.
- Shared environmental effects can be tested among adoptive siblings, biologically unrelated people who grew up together.
- Nonshared environmental effects, unique to the individual, can be measured by identical twins who grew up apart.
- Shared heritability effects.
Sources of discontinuity: there are distinct stages of cognitive development, with the following properties

- Qualitative change: children of different ages think in different ways
- Broad applicability
- Brief transitions
- Invariant sequence

Piaget’s stages

- Sensorimotor stage (birth-2): knowledge develops through sensory and motor abilities
- Preoperational stage (2-7): knowledge is represented by language, mental imagery, and symbolic thought
- Concrete operational stage (7-12): children can reason logically about concrete objects and events
- Formal operational stage (12 and up): children can think deeply about concrete events and can reason abstractly and hypothetically

Piaget’s sensorimotor stage

- Six substages
  - Object permanence: the knowledge that things continue to exist when out of sight
  - Deferred imitation: the repetition of other people’s behavior after a delay

Piaget’s preoperational stage

- Development of symbolic representations: the use of one object to stand for another
- Egocentrism: looking at the world only from one’s point of view
- Animism: attributing life and consciousness to physical objects
- Artificialism: assuming that environmental events are human inventions
- Centration: focusing on a single feature of an object or event

Piaget’s concrete operational stage

- Stage in which logical thinking begins
- Exemplified by development of the conservation concept
  - Children understand the conservation concept when they realize that changing the appearance or arrangement of objects does not necessarily change other key properties
- Conservation concepts
  - Conservation of liquid quantity
  - Conservation of solid quantity
  - Conservation of number

Piaget’s formal operations stage

- Ability to think abstractly and reason hypothetically
- Ability to engage in scientific thinking

Strengths of Piaget’s theory

- Children actively seek and construct knowledge
- Development follows an invariant sequence