Hormone-Behavior Interactions
Hormone – Behavior Interactions

- Deals with both the way physiology affects behavior and with how behavior affects physiology
- Former more familiar than the latter
- For women, lots of stereotypes address the ways in which physiology affects behavior.
Stereotypes

- Strong beliefs about negative effects of the premenstrual phase of the monthly cycle on mood and behavior can be found in political and philosophical writings throughout history.

- Throughout most of the 20th century, physiological and psychological study took these beliefs as fact.
Many studies show that women and men in the US have strong negative stereotypes about women’s moods and behaviors around menses.

Parlee: both women and men report that women experience very negative symptoms around menses
Stereotypes

- Strong stereotypes led to relaxed standards on scientific procedures in the study of mood or behavior and the monthly cycle.
- Resulted in publication of many studies that were poorly designed and yielded dubious results.
Stereotypes & Research

- Stereotype says that virtually all women experience negative mood and often debilitating behavior changes pre-menstrually.

- Much research supported this conclusion but the high incidence of Premenstrual Syndrome (PMS) was strongly influenced by the biases of researchers and poor research methodology.
Mood & Behavior Across the Monthly Cycle

Recall Studies
- always a problematic way to assess symptoms
- particularly true when there are strong stereotypes about typical experiences in a situation or condition
Recall Studies

- When recall is used to assess changes in mood and behavior across the cycle:
  - All studies find increased negative moods and behaviors premenstrually.
  - A few studies find an increase of positive moods during the follicular phase or midcycle.
    - ignored
    - attributed to a contrast effect
Concurrent Studies

- Women asked to keep daily diaries of moods, behaviors, and cycle phase.
- Thought to provide a more accurate measure of mood and behaviors less tainted by stereotypes – particularly if the women do not know that cycle-mood relationships are being studied.
Concurrent Studies

- Women report more positive moods and behaviors during the follicular phase or at mid-cycle.
- No increase in negative moods and behaviors during the premenstrual phase of the cycle is noted.
1. Daily diaries of normally-cycling women show significantly more positive mood during the follicular phase (here divided into menstrual and follicular).

2. Daily mood pleasantness of women on oral contraceptives does not differ from that of men randomly assigned a cycle phase.

*Figure 2.* Mood pleasantness ratings for women who were normally cycling (womenNC), women taking oral contraceptives (womenOC), and men, for each phase of the menstrual cycle (*p*<.05, **p**<.01).
When asked to recall moods across cycle phases, women report significantly less pleasant moods during the premenstrual and menstrual phases of the cycle compared to the same women doing daily recordings of mood across the cycle. Note that in this study, mood pleasantness is recalled as significantly more positive than indicated in daily reports during the follicular phase.
Conclusion of General Population Work

- Studies using recall methods still report negative mood and behavior changes around the time of menses.
- Studies using concurrent recording of moods and behaviors show no increase in negative moods and behaviors in the premenstruum.
- Concurrent recording studies show increases in positive moods and behaviors during the follicular phase or at mid-cycle — but these are not part of our cultural stereotypes.
Premonstrual Syndrome (PMS)

- Defined as the recurrent presence of problematic physical and emotional symptoms during the perimenstruum – defined as the 7 days before menses and up to 3 days after the start of menses.

- Can include physical symptoms such as headache, backache, abdominal pain, fatigue, nausea, etc. as well as emotional symptoms.
Premenstrual Syndrome (PMS)

- Experienced by approximately 11% of cycling women
- Symptoms must be confined to the perimenstruum and absent outside of this time period.
- Cannot be an exaggeration of symptoms always present.
Premenstrual Magnification Pattern

- In some cases, symptoms are present throughout the month but become aggravated during the perimenstruum.
- This is referred to as the Premenstrual Magnification Pattern or PMM.
- Can see magnification of symptoms of a lot of physical and psychological conditions.
Premenstrual Dysphoric Disorder (PMDD)

- More rigorous definition than PMS
- To be diagnosed with PMDD, the individual needs to recurrently experience 5 or more symptoms during the perimenstruum during nearly all cycles (and be symptom free outside of that time period).
PMDD Symptoms

- At least one of the following 4 symptoms must occur:
  - Marked **affective lability** – mood swings, sudden tearfulness, increased sensitivity to rejection
  - Marked **irritability or anger** – increased interpersonal conflicts
  - Marked **depressed mood**, feelings of hopelessness or self-deprecating thoughts
  - Marked **anxiety, tension**, feelings of being keyed up or on edge
PMDD Symptoms

- Other symptoms could include:
  - Decreased interest in usual activities
  - Sense of difficulty concentrating
  - Lethargy, marked lack of energy
  - Change of appetite – overeating or specific food cravings
  - Hypersomnia or insomnia
  - Feeling of being overwhelmed or out of control
  - Physical symptoms such as breast tenderness, bloating, aching joints
PMDD Symptoms

- Symptoms must be associated with significant distress or interfere with work, social activities and/or relationships.
- Symptoms must be confirmed by daily diary for at least 2 cycles.
- Cannot be due to licit or illicit drug use or due to a general medical condition.
- Experienced by 3-8% of cycling women.
Treatment

- No 100% effective treatment for all women.
- Many treatments show some success.
- Least invasive treatments should be tried first.
Treatment

- Non-pharmacological Interventions (least invasive):
  - Awareness
  - Improved social support
  - Cognitive-behavioral therapy
  - Changed diet - to high carbohydrate/low protein; decreased caffeine; decreased sodium; increased calcium intake
  - Increased aerobic exercise
  - More are listed in the reading by Rapkin.
Treatment

- Pharmacological Treatments:
  - Selective Serotonin Reuptake Inhibitors (SSRIs) like fluoxetine (Prozac) & sertraline (Zoloft)
  - Anxiolytics like alprazolam (Xanax)
  - Hormonal Contraceptives and GnRH agonists (like Lupron) that stop the cycle
Menstrual Synchrony

- When women live together, their cycles become more synchronous
- First described by McClintock - 1971
Menstrual Synchrony

- Synchrony may be based on pheromonal secretions (McClintock, 1971)
- **Pheromones**: airborne chemical signals which affect the physiology or behavior of other members of the same species often over great distances.
- Exposure to underarm perspiration of donor draws cycles of recipient women into closer synchrony with that of the donor (Russell et al., 1980)
Pheromones & Cycle Length

- Stern & McClintock, 1998
  - Donor underarm secretions from late follicular phase (postmenses to day before LH surge)
  - Recipient has earlier LH surge (ovulation) than would be expected
  - Recipient’s total cycle length is shorter than typical
Late Follicular

- After menses to day before LH surge (ovulation)
- Recipient ovulates sooner
- Recipient’s cycle is shorter

Menses

Day 1
First Day of Menses

Ovulation
Separates first and second halves of cycle

Day 1
First Day of Menses
Pheromones & Cycle Length

- Stern & McClintock, 1998
  - Donor underarm secretions from ovulation phase of cycle
  - Results in **delayed LH surge in** recipient
  - And **increased total cycle length** for recipient
  - Note: all effects in follicular phase suggesting effect on follicular maturation or estrogen release
Ovulation Phase

- Day 1: First Day of Menses
- At LH surge: Ovulation
  - Separates first and second halves of cycle
  - Recipient ovulates later
  - Recipient’s cycle is longer
Menstrual Synchrony

- Synchrony does not develop under all living conditions
- Specific factors which support the development of synchrony are not clear
Menstrual Synchrony

- greater number of shared activities may result in greater likelihood of synchrony
- But some studies show that cohabiting lesbian couples do not become synchronous - others do!
Men and Cycle Length

- Exposure to men may result in shorter cycles

- McClintock (1971) - women in contact with men at least 3 times per week have shorter cycles

- Burleson (1995) - intercourse at least once a week results in more regular cycle length (most apparent in young women).
Stress and Cycle Length

- Sudden, severe psychological stress can influence cycle length
- Effect on cycle depends on when the stress occurs
  - Stress during preovulatory phase = increased cycle length, delayed ovulation
  - Stress during postovulatory phase = decreased cycle length, earlier menses