Chromosomes, Genes, and Neurochemical Tsunamis

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Brain References
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This presentation is not designed to be theological or ecclesiastical—it is designed to share:

- Research conclusions related to chromosomes, genes, and neurochemical tsunamis
- Hormones and chemicals released during romantic / sexual encounters versus those released in a long-term committed partnership or marriage
- Tips for people (of any age) to help them make wise decisions
Human Beings Are:

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✓ **Spiritual** – the spirit in which you live life (not necessarily involving religion)

✓ **Relational** – connections with other human beings, creatures, and nature

✓ **Sexual** – genetic and epigenetic composition of brain-body including preferences

Can develop addictive behaviors to religion, relationships, and sexual behaviors based on dopamine rewards

What you don’t know you don’t know can blind-side you…
Everything begins in your brain—it is your primary relational, spiritual, and sexual organ.

People readily discuss and argue relational and spiritual topics.

Sexual topics? Not so much—there is a great deal of misinformation out there—although human sexuality impacts every aspect of life, personal and professional.
Reasons for This Topic
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Pairs 1-22 are numbered by size and appearance; typically are the same in males and females.

Pair 23 sex chromosomes X and Y (typical pattern is XX female and XY male).

Ovum: largest human cell
Sperm: smallest human cell
A fetal brain typically is expected to template into either a primarily **Empathizing** or a primarily **Systemizing** brain and match its body housing.

<table>
<thead>
<tr>
<th>Empathizing Brain</th>
<th>Systemizing Brain</th>
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<tr>
<td>Equated with</td>
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<td>female brains – XX</td>
<td>male brains – XY</td>
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Checklists of psychological femaleness or maleness gave two scores as humans are a mix of empathizing and systemizing characteristics—Dr. Simon Baron-Cohen estimated that 95% of human beings would fit on this continuum.
Professor Daphna Joel and colleagues at Tel-Aviv University analyzed brain scans of more than 1400 men and women and reported:

While some features are more common in one gender than the other, each person’s brain has a unique ‘mosaic’ of these features as well as others seen commonly in both genders.

Brain scans showed there are multiple ways to be male and female, there is not just one way, and most of these ways are completely overlapping.
Current Caveats

- Human brains are more alike than they are different—and there is no ‘default’ position.
- A person’s ‘gender’ cannot be determined with any certainty by looking at the brain.
- Some individuals have congruent chromosomes, genes, internal sex organs, external genitalia, and personal perception, but more are gender non-conforming than previously thought.
- So far, humans with a ‘Y’ chromosome are considered male.
<table>
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<tr>
<th>Empathizing Brain</th>
<th>Inter-Sex</th>
<th>Systemizing Brain</th>
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<tr>
<td>Equated with female brains – XX or XO</td>
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<td>Equated with male brains – XY or XXY</td>
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More chromosomal patterns were identified – a section was added for individuals who were Intersex (possess both male and female organs).

Gradually, more and more chromosomal patterns were identified so a separate illustration for chromosomal complexity was needed.
Chromosomal Complexity, Cont’d

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XY-F* The SRY gene that triggers testis development is damaged (XY-Female appearance)

XY-F* The SRY gene is copied inside the X (XX-Male appearance)

XXY = 1/1000 male births

XXYY = 1/18,000 – 40,000 male births
‘Y’ chromosome patterns show more variation and are linked with a higher risk for sexual misuse and sexual addictions.

**Sexual addiction**: a condition that involves the sufferer becoming excessively preoccupied with thoughts or behaviors that give a desired sexual effect (provide a ‘high’ that alters brain state).

Is Sex Misuse a Problem?
United States of America:

- 40 million are sexually involved with Internet sites
- Sex is the number one topic searched
- 25% of search engine requests are porn related
- 1 in 20 suffer from a sexual compulsion disorder (likely underestimated as data comes from those seeking treatment for sex addiction)

—http://www.medicinenet.com/sexual_addiction/article
• 25% of those with Internet access at work viewed pornography during working hours

• Christians: 50% of males and 20% of females admitted to being addicted to pornography

• Promise Keepers: 53% of males admitted viewing pornography in past week

• Pastors: 54% admitted viewing Internet porn in the last year; 30% within the last month

http://www.myaddiction.com/education/articles/sex_statistics.html
http://www.safefamilies.org/sfStats.php
Pornography boosts dopamine - porn on demand tends to be very addictive.

Social media boosts dopamine - checking often for messages provides a 400% spike in dopamine, only slightly less than cocaine (The ‘Magic of Maybe’ – Stanford Neuroendocrinologist Robert Sapolsky PhD).

Alcohol boosts dopamine initially - there’s a legal age of 21—Internet, pornography, and social media, etc., are accessed by people of every age.

—Steven Kitler & Jamie Wheal, Stealing Fire, ‘17
Major Risk Factors

1. Driving forces for sexual misuse / addictions appear to be poor self-esteem and poor self-image rather than excessive thrill seeking

2. Psychiatric disorders including problems such as depression and anxiety

3. Self-medication as a reaction to stressors or to painful / unpleasant emotional memories

4. Abuse during childhood or family dysfunction

5. Other addictions (e.g., substances, gambling)
Neuroscientist Gert Holstege and colleagues, University of Groningen in the Netherlands, studied PET Scans during male ejaculation.

There was extraordinary activation of the ventral tegmental area, a major hub of the brain's reward circuitry.

Bottom Line: ‘The intensity of the male response (at ejaculation) is comparable to that induced by heroin’ —Scientific American Mind 2016
Gert Holstege and colleagues studied PET Scans during female orgasm

Much of the female brain went ‘silent’ (at orgasm) suggesting a release of tension and inhibition, and a reduction in moral reasoning, vigilance, social judgment, reflection…

Bottom line: ‘At the moment of orgasm, women do not have any emotional feelings…fear and anxiety need to be avoided at all costs if a woman wishes to have an orgasm’

—Scientific American Mind 2016
If not actually encouraged to sow their wild oats, promiscuity is accepted as more of a male norm—that’s unfortunate since every sexual encounter builds cellular memory for that individual encounter, which can make attempts at being monogamous after marriage more difficult.

In some cultures: females are encouraged to look sexual (arm candy for their partner), which makes the male feel important and envied; but the females often are punished emotionally if not physically should they respond to any flirting.
Notice the person’s clothes, eyes, figure

Appreciation of the sex partner is more romantic than sexual

Attracted to wealth, position, skill; tend to see possibilities

Relatively less brain space is devoted to a sexual drive

Attracted first to figure, face, hair, and clothes

Decide in about 7 seconds if they want to get better acquainted

More aggressive and fall in love faster (25% by first date)

2.5 times brain space devoted to sexual drive and assertiveness
Gender Generalizations
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May engage in sexual activity when they really are looking for love

Tend to withhold sex from partner when they are angry

May fail to insist on protection for fear of rejection (↑ the risk of STDs and pregnancy)

May talk of love when they really are looking for sexual activity

Are more conditioned by past sexual experiences

May override partner’s wishes (e.g., stronger, macho tendencies, alcohol and drugs)
When two individuals say ‘We have chemistry!’ they are correct—that’s pretty much all it is initially, just brain neurochemistry.

By misunderstanding this many have made disastrous liaisons and / or untenable marriages.

Society has been remiss in failing to teach its members about the brain-body chemistry of infatuation—sexual and romantic attraction—versus committed monogamous love.
It begins in the brain and involves hormones, neurotransmitters, and sexual energy.

The specific chemicals triggered appear to depend on the situation: a sexual or romantic encounter or a committed life-partner situation.

Individuals who are attracted romantically and whose brains are not yet mature or have little if any valid information, may be at increased risk for unwise liaisons or partnering.
A sense of falling in love or romantic or sexual attraction is fueled by a tsunami of ‘attraction’ neurochemicals

A-1: Phenylethylamine
A-2: Norepinephrine
A-3: Dopamine

This initial brain neurochemical impetus can be very powerful—unmanaged it may result in unplanned ‘affairs,’ pregnancy, STDs, or move one toward long-term partnering or marriage
The brain is the most amazing organ on this planet and likely in the known universe, as well—it works 24 hours a day, 365 days a year, from birth to death—until you ‘fall in love’

Then your brain gets hijacked and carried away by phenylethylamine or PEA, which results in the ‘pea-brain effect’ (reduction in quality judgment, decision-making, conscience, boundaries...)

It puts you at high risk of becoming a Pea Brain
A naturally occurring neurotransmitter that resembles an amphetamine (stimulant); it is responsible for the elation, lack of mental clarity, and head-over-heels sensations associated with ‘falling in love’ or ‘sexual attraction’

PEA triggers the release of two other powerful ‘attraction’ love chemicals norepinephrine and dopamine

PEA is also found in foods such as dark chocolate and avocado
Both a hormone and a neurotransmitter, it works with the autonomic nervous system (subconscious) and regulates sexual arousal

[A neurotransmitter impacts all neurons in the brain, heart, GI Tract, and anywhere else they may exist; a hormone impacts all other cells—so a substance that is both is extremely powerful]

PEA triggers the release of norepinephrine, which you sense in the form of sweaty palms, light headed, pounding heart, gut butterflies . . .
A neurotransmitter that helps control the brain’s reward system (ventral tegmental area, a major hub), bonding and emotional responses, and is associated with all addictive behaviors.

Levels rise with the anticipation of feeling better, as adrenalin levels rise, and with sexual activity (50% is in gut).

Emory University rodent studies: when female voles were injected with dopamine in the presence of a male vole, they later selected him from a group of males—a purely chemical choice.
Chemically speaking, the intense neurochemical honeymoon period lasts about 18 months into a relationship.

After that, you may have some small neurochemical tsunamis but rarely as intense as it ‘used to be’.

Some never make it past the PEA stage, moving from one relationship to another as soon as PEA begins to fall, trying to recapture that passionate PEA brain stage.
It is easy to become addicted to PEA—especially when you don’t understand the neurochemistry and/or life doesn’t seem particularly rewarding

At times the honeymoon effect may last longer than 18 months (maybe up to 48 months) when:

- Individuals live long distances apart and see each other relatively infrequently
- Relationship includes sexual activity
If one or both are addicted to PEA and they partner or marry, one or both may have emotional or sexual extramarital affairs trying desperately to re-experience the neurochemical tsunami.

The more sexual partners you have prior to marriage, the harder it may be to remain monogamous as PEA falls (cellular memory for variety) . . . and the higher at risk you are for becoming involved with alternative sexual behaviors trying to re-capture earlier intensity (phone or internet sex, masturbation, porn).
Relationships that last longer than 18-48 months (especially if the couple partner long-term or marry) are assisted by three ‘bonding’ neurochemicals that are also very powerful but that differ from the three ‘attraction’ neurochemicals

B-1: Endorphins
B-2: Oxytocin
B-3: Serotonin
As the brain develops tolerance to the three attraction chemicals, it begins to release endorphins—endogenous opioid neuropeptides that are produced by the brain, central nervous system, and pituitary gland when individuals are in a committed relationship.

Physical exercise, committed love, and sexual activity can increase levels of these morphine-like substances—increase attachment and comfort, calm anxiety, reduce stress, and relieve pain.
Oxytocin is a hormone that plays a role in the neuroanatomy of intimacy, pair bonding (sexual activity increases oxytocin), and maternal behaviors.

Evokes a sense of contentment and a decrease in anxiety and stress, promotes feelings of calmness and security when in the company of one’s mate and allows orgasm to occur.

Oxytocin crosses the Blood Brain Barrier but is destroyed in the GI Tract.
Serotonin is a neurotransmitter required for the brain and nervous system to function properly (10% is in Brain and CNS; 90 % is in the gut)

It impacts mood and contributes to a sense of happiness and well-being; too much can trigger symptoms that range from GI upsets to seizures that can lead to death

Mild to moderate physical exercise (including sexual activity) increases levels
Think Ahead!
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To avoid getting caught in a Phenylethylamine (PEA) addiction:

• Identify key characteristics you want in a partner—and then become the person that you want to attract

• Set clear moral standards and boundaries

• Evaluate carefully whether you want that individual to be the parent of your child(ren) or uncle/aunt to nieces and nephews
Get to know the other individual’s family—do you want that family as relatives for you and your child?

The more you have in common, the less energy it will require to keep the relationship going.

Trying to change the other person is like barking up the wrong tree or heading down a one-way dead-end street.

The past is the best predictor of the future.
Where there is an ongoing relationship of caring; where there is a sense of humor; where there is a sense of mutual mercy; and where there is a sense that God has given sex to you... there is nothing livelier

But when it is merchandised as a commodity for instant gratification, there is nothing deadlier than sex

—William Swing
It is not that I do not know what to do; it is that I do not DO what I know — Confucius

Information alone is insufficient; must deal with underlying risk factors, turn information into knowledge, practically apply it on a daily basis, and course correct as needed

When you know better you can choose to do better

You are the only one—who can DO it for you!