**Neurobiology of Sexual Assault:**
Experience, Thinking, Behavior, & Memory

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Jim Hopper, Ph.D.
Independent Consultant &
Harvard Medical School
drhopper@jimhopper.com

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**Value of knowing the relevant neurobiological, memory and other science?**
It can **help us answer** four common important questions...

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**4 Common Questions**

1. Why didn’t they fight, yell, or otherwise resist, leave, etc.?
2. Why do they have memory gaps?
3. Why do they have memories that are inconsistent and/or contradictory?
4. Why do they struggle to recall the sequence of what they can remember?
4 Basic Scenarios

1. Encounter was consensual and person reporting sexual assault knows that but is misrepresenting/lying. (Rare)

2. Was consensual, but person reporting it later reinterpreted as non-consensual.

3. Wasn’t consensual, but accused sincerely believes it was.

4. Wasn’t consensual and accused knows it.

3 and 4: Victim’s responses and memories may be consistent with the neurobiological impacts of stress/trauma.

Yes, awkward and confusing sexual encounters can be re-interpreted afterward and reported as assaults

That’s NOT what I’m teaching about.

Not assuming “evidence.”

Pointing to what could be consistent with assault.

Providing knowledge to solve problems you face.
1. Why didn’t they fight, yell, or otherwise resist, leave, etc.?
2. Why do they have memory gaps?
3. Why do they have memories that are inconsistent and/or contradictory?
4. Why do they struggle to recall the sequence of what they can remember?

**Conventional Wisdom**

Brain-based behaviors during high-stress/trauma:
- “fight or flight”
- “fight, flight, freeze”
- “fight, flight, freeze, [whatever]”
- “faint” or “flop,” “fawn” or “friend”

**We Need Greater Clarity**

What does “fight or flight” actually mean?
What does “freeze” mean?
What does “fawn” mean?
What about various possible habit responses?
Are we really stuck with these f-words?
Problems with “Fight or Flight”

Walter Cannon was a physiologist. He didn’t even study behavior. Confuses physiology and behavior. Many people don’t fight or flee while being sexually assaulted. Blame/shame: People think those are normal/common responses.

Closest he ever got? “the necessities of fighting or flight” (page 215)

“Fight or Flight” Was Never Supposed to be About Behavior
We Need New Concepts and Language

Physiology: “Survival Mode”
Behavior: “Reflexes & Habits”

Let’s not confuse physiology and behavior.

Defense Circuitry

Defense Circuitry in Control

- Impaired prefrontal cortex
- Bottom-up attention
- Survival reflexes
- Self-protection habits
- Altered memory encoding and storage
Prefrontal Cortex

High Stress and Fear = Impaired Prefrontal Cortex

Weapon Focus
Bottom-up Attention
Survival Mode
Reflexes & Habits

Defense circuitry directly implements reflexes

Defense circuitry indirectly triggers habit behaviors
(via outputs to habit circuitry)
There is no “fight circuitry” or “flight circuitry” in the brain. Fighting and fleeing can be reflexes or habits.

**Survival Reflexes**
Detection Freezing

Stop everything, hold down brake, scan

Key moment, when attack is detected
Shocked Freezing

Blank mind, no behavior options arising

When behavior options and thoughts do (finally) arise...

No-Good-Choices Freezing

“All I could think was…”
Extremely Passive vs. Extremely Reactive
If freezing happens, what usually follows?
If freezing doesn’t happen, what types of behaviors usually come first?

Self-Protection Habits
- Polite, passive, submissive responses
  - To dominant or aggressive people
  - To unwanted sexual advances
- Cultural software that runs on biological hardware/habit circuitry
Fear-Habit Paradox

From normal, expected scenario to unexpected attack...
Initial responses can be habit behaviors based on the just-prior normal interaction

I have to leave soon.
You’ve got a girlfriend.
My roommate is home.
My boyfriend will be angry.

Real Case
Perpetrator describing methods on social media:
“Feign intimacy,” “then stab them in the back” and “THROW EM IN THE DUMPSTER.”

His victim at trial:
• “I didn’t kick or scream or push.”
• “I felt like I was frozen.”
• “I tried to be as polite as possible.”
• “I wanted to not cause a conflict”
• “I didn’t want to offend him.”
Self-Protection Habits

- **Cultural software** that runs on biological hardware/habit circuitry
- Common and unique ways of submitting, learned from experiences with:
  - Families, communities, organizations
  - Domination and discrimination based on sex, race, class, etc.
What’s Wrong With “Fawn”

What has the word always meant?

Not a common response

Victims can hear it as implying attitudes and behaviors that:

- Don’t match their experience
- Don’t match reality
- Are degrading

Are these women definitely about to court favor, flatter, or show affection?

How might they feel if you tell them that “fight, flight, freeze and fawn” are “the” behaviors of people during harassment or assaults?
Extreme Survival Reflexes

Escape When There’s No (Perceived) Escape

Tonic Immobility

- Freezing = Alert and immobile, but able to move
- Tonic immobility = Paralysis, can’t move or speak
- Caused by extreme fear, physical contact with perpetrator, restraint, perception of inescapability
- Not uncommon in sexual and non-sexual assaults

Collapsed Immobility

Key differences from tonic immobility

- Physiological cause = Heart gets massive parasympathetic input, resulting in...
- Extreme ↓ in heart rate and blood pressure
- Faintness, “sleepiness” or loss of consciousness
- Loss of muscle tone – Collapsed, limp, etc.

Kozlowski et al., 2015, Harvard Rev Psychiatry, 1-25; Baldwin 2013, Neurosci Biobehav Rev, 1549
I felt like a rag doll.

He was just moving me around.
Is it a problem not to know about tonic and collapsed immobility, and just think “freeze”? How does knowing that TI and CI are different survival reflexes – from freezing and from each other – help you to listen better? To understand complainants’ experiences?

Dissociation
Blanked/Spaced Out
Disconnected from Body
Autopilot
Does “fight, flight, freeze, [whatever]” help you listen for and gather more information about reflexive dissociative responses? Or does it get in the way?

Did not resist
No attempt to escape
Did not scream
‘Active participant’

Reflexes & Habits

Freezing
• Detection
• Shocked
• No-Good-Choices

Passive, Polite
• From dating
• From child abuse
• From domination

Extreme Survival Reflexes
• Tonic Immobility
• Collapsed Immobility
• Dissociation

Dissociative
• Autopilot
• Submission
• Sex acts
“Reflexes and Habits” Is Much Better Than “Fight or Flight”

Language that reflects the realities of sexual assault and its neurobiology.
Adding “freeze” can’t salvage a phrase that harms sexual assault survivors.
Jim Hopper, PhD – February 12, 2021

Perpetrator
- Not particularly stressed
- Prefrontal cortex in control
- Thinking and behavior:
  - Planned
  - Practiced
  - Habitual

Victim
- Stressed, traumatized
- Defense circuitry in control
- Attention and thoughts driven by perpetrator actions
- Behavior controlled by reflexes and habits

Repeat Rape by College Men

Research suggests that about two-thirds of college rapes are repeat offenses, who account for the great majority of rapes (over 80%), and that about one-fourth of college rapists admit to committing rapes over multiple years of college.
A sexual assault victim can engage in habit behaviors with or without being disconnected from sensations and emotions. If dissociation does kick in and the person continues with habit behaviors, that's dissociative autopilot – which involves no sense of choosing the habit behaviors in which one is engaging, which can include sex acts.

Dissociation may or may not accompany tonic immobility. Someone may be unable to move, yell, or even speak – yet be fully aware of the horrible sensations of being assaulted and intense emotions of fear, disgust, etc. However, dissociation is common in tonic immobility states, when physical escape is impossible and mental escape is the only option.

Is it helpful to know dissociation is a reflexive response that may or may not overlap with other survival reflexes or various habit behaviors?
Think (maybe say) “Reflexes and Habits,” Then Use Their Words:

“Froze” “Just kept saying...” “Begged him not to...”
“In shock” “Paralyzed” “Politely pushed him away”
“Couldn’t move” “Passed out” “On autopilot”
“Disconnected from my body” “Gave in” “Just did what he wanted”

More Clarity, Better Listening, and More Helpful in What We Say

Clients talking about their responses during assaults need to be truly heard and understood.

Listen with framework of more accurate concepts.
Don’t jump to conclusions.

Don’t impose simplistic ideas about “fight, flight, freeze, [whatever]”

Remember reflexes and habits!

IPV / Repeated Physical Assaults

Still mostly reflexes and habits

• PTSD / Hypervigilance: Scanning for signals
• Detection freezing triggered by tone of voice, particular words, body language, etc.
• Habits of avoidance triggered by signals
• Habits of appeasing, (depressed) submission, protecting children, etc.
IPV / Repeated Physical Assaults

Dissociation increasingly likely
• Mentally escape the physically inescapable
• Block out physical and emotional pain
• Block out hopes of escape
• Lots of autopilot mode

4 Common Questions
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Sexual Assault and Memory
Bottom-Up Attention and Memory

Defense circuitry focus: **what seems most important** to survival and coping

Attended = **Central Details** = Encoded

Episodic Memory Circuitry

Hippocampus
Are you getting the central details?

Key moment, when attack is detected

Time-Dependent Hippocampus Effects

Predict = Survive

Zoladz et al., 2014, in Costa & Villalba (Eds.), Horizons in Neuroscience Research (Vol. 14), 1-40.
Are you getting and using central/early details?

**Implications**

1. Very stressed or traumatized victims **cannot recall everything recorded** in their brains, no matter how good and gentle the interview.
2. Two or more interviews (over days) may yield much more information than one.
3. Yes, recall **can get better over time!**
Vulnerability to Distortion?

- Central Details = Very Low Vulnerability
- Peripheral details = High Vulnerability

Gist

Abstract
Stripped of many details


Implications

4. Lots of details missing, even some central details? **Gist still there.**
5. More time since assault = More of recall is gist + reconstructed details.
6. However long ago, central details can be vivid and accurate. Don’t miss them!
Does alcohol change any of this?

Alcohol and Memory

- **Low-moderate dose/intoxication**
  - Impairs context encoding
  - Does not impair encoding of sensations
  - Resembles effect of fear/trauma

- **High dose/intoxication**:
  - Impairs hippocampus-mediated encoding and consolidation of both context and sensations

Melia...LeDoux, 1996, Neuroscience, 74, S13
Bisby et al. 2008, Psychopharmacology, 205, 655; Bisby et al. 2010, Biol Psychiatry, 68, 280

Fear/Horror/Pain Can “Break Through” Severe Alcohol/Drug Effects

Sexual Assault Unfolding Over Time

- Enough fear/horror/pain to break through
Where there is a FRAGMENT there was usually...

FEAR  HORROR  PAIN

So listen and explore for them

IPV / Repeated Assaults

Like arguments of married couples
  • Fight over same things, say same things

What do we remember?
  • Not every detail, date, order of things said
  • First/early really bad argument, and last one
  • One or two really bad ones in the middle
  • Common phrases, very disturbing details
Value of knowing and applying the relevant neurobiological, memory and other science?

It can help us understand victims, help them feel safe and supported, and get their ongoing cooperation.

Basic Principles of Interviewing
Begin open-ended: “What are you able to tell me about your experience?” Then listen...

Key Method: Funnel

- Open-ended questions
- Open-ended prompts
- Option-posing questions
- Yes/no only at the end, very carefully
- Never leading questions
Open-Ended Questions

- “What are you able to remember about your experience?”
- “What are you able to remember about what happened with [reported perpetrator] that night?”

Open-Ended Prompts

- “You said he had his hand over your mouth. Tell me everything about that.”
- “You said that you couldn’t move at one point. Tell me everything you can remember about that.”
- “You said you were terrified. Tell me all about that.”

Option-Posing & Yes/No Questions

Only at the end, and only if open-ended prompts haven’t worked...

- “Did he hold you down with his hands or with another part of his body?”
- “Did he say anything?”
- Follow with open-ended prompt (e.g., “Tell me everything you remember about him holding you down with his forearms.”)
Centrality of Sensations

What if anything do you remember...

- Seeing?
- Hearing?
- Touching you?
- Feeling in your body?
- Smelling? Tasting?
- Thinking?

Thoughts Important Too

What if anything do you remember thinking?

“Even if they were thoughts or ideas that you now think are ridiculous, that’s OK.”

“You mentioned a time when your legs were pinned down. What if anything do you remember thinking then?”

Interviewer pushing for peripheral details or sequence, asking leading questions...

Can CREATE inconsistent memories
Interviewer doubting and disbelieving...

Can CAUSE inconsistencies, even lies

Practical Advice 1
Make sure you get “big shifts”
• When attack detected, e.g., initial freeze and appraisal
• When extreme survival reflex or other “defeat” responses kicked in

Practical Advice 2
Make sure you get as much information as possible about:
• Prefrontal cortex deficits
• Survival reflexes
• Habit behaviors
• Central details
• Sensations and thoughts that convey victim’s experience