

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

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Value of knowing the relevant
neurobiological, memory and
other science?

It can **help us answer** four
common important questions...

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

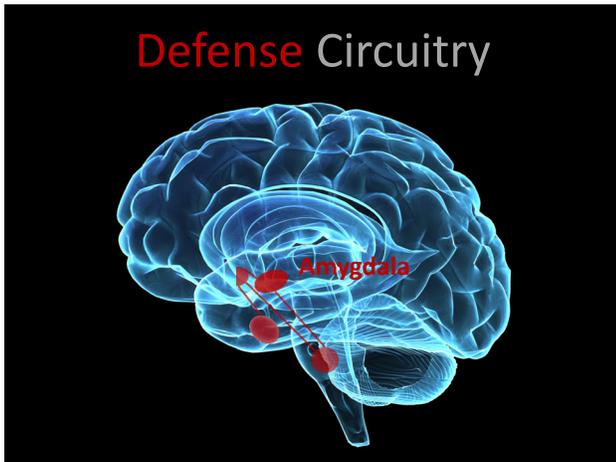
That's NOT what I'm teaching about.

Not assuming "evidence."

Pointing to what could be consistent with assault.

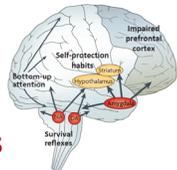
Providing knowledge to solve problems you face.

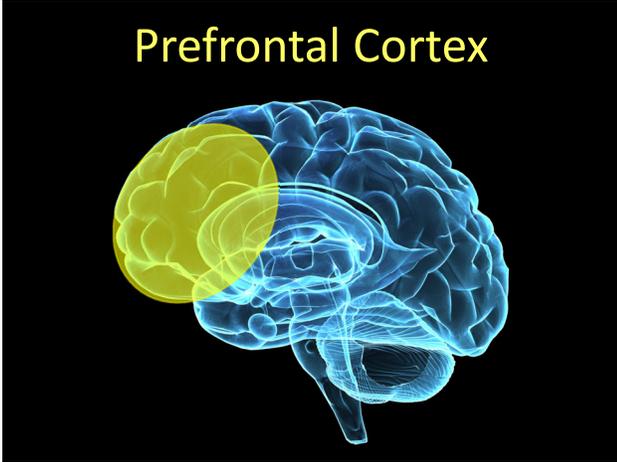
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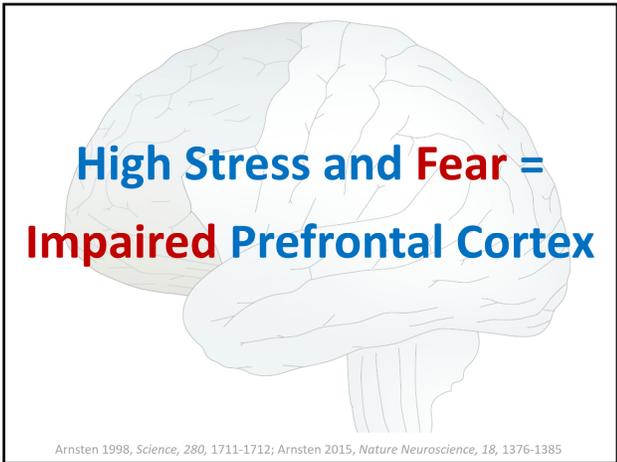


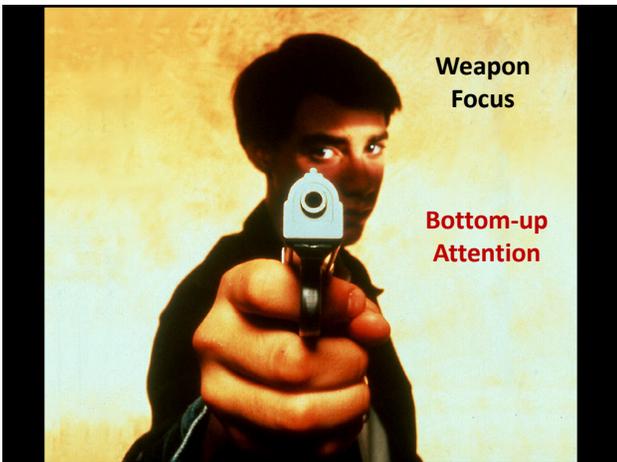
Defense Circuitry in Control

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









Survival Mode
Reflexes & Habits

Survival Reflexes



Detection Freezing



Stop everything, hold down brake, scan

Key moment, when

attack

is detected

Going out for a nice dinner...



Shocked Freezing



Blank mind, no behavior options arising

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

No-Good-Choices Freezing

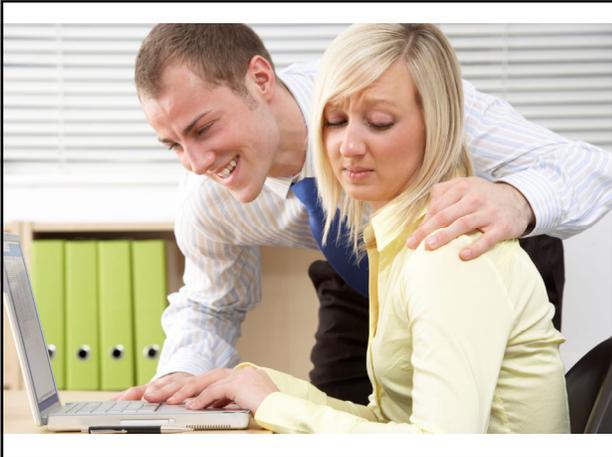


All I could think was..."

Extremely Passive vs. Extremely Reactive

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

e.g., Schwabe 2013, *Hippocampus*, 1035-1043; Packard 2009, *Brain Research*, 121-128

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.

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**

Moller et al., 2017, *Acta Obstet Gynecol Scand*, 932; Marx et al. 2008, *Clin Psychol Sci Practice*, 74; Bovin et al. 2008, *J Trauma Stress*, 402; Fuse et al. 2007, *J Anx Disord*, 265





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.

Dissociation

- Blanked/Spaced Out
- Disconnected from Body
- Autopilot



Did not resist
No attempt to escape
Did not scream
'Active participant'

Reflexes & Habits

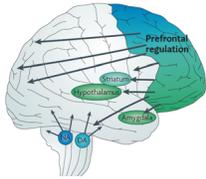
Freezing <ul style="list-style-type: none">• Detection• Shocked• No-Good-Choices	Passive, Polite <ul style="list-style-type: none">• From dating• From child abuse• From domination
Extreme Survival Reflexes <ul style="list-style-type: none">• Tonic Immobility• Collapsed Immobility• Dissociation	Dissociative <ul style="list-style-type: none">• 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.

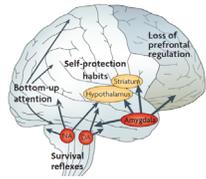
Jim Hopper, PhD – February 12, 2021





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

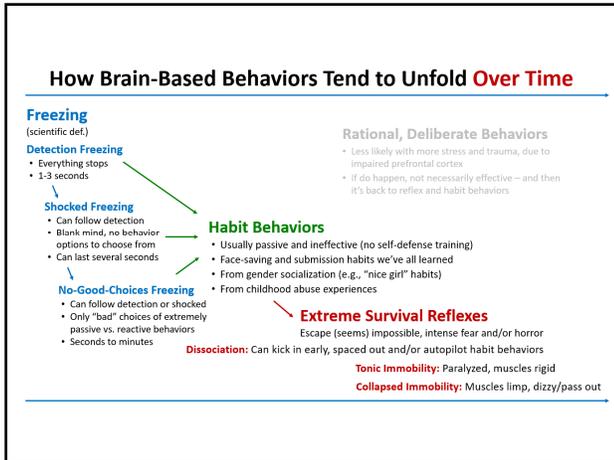
Jim Hopper PH.D | Repeat Rape

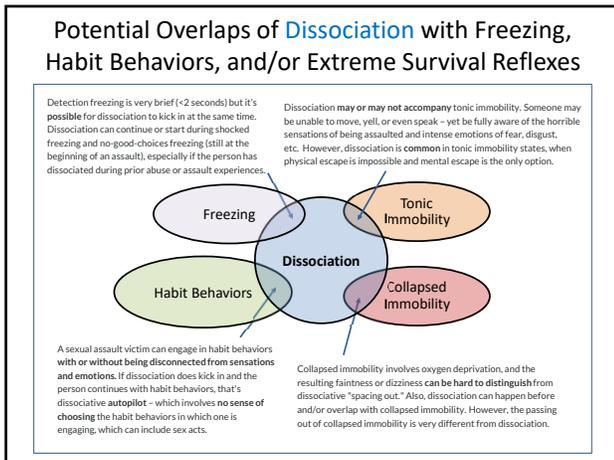
TOPICS ▾ ABOUT SERVICES PUBLICATIONS SITEMAP

SEXUAL ASSAULT

Repeat Rape by College Men

Research suggests that about two-thirds of college rapists are repeat offenders, who account for the great majority of rapes (over 90%), and that about one-fourth of college rapists admit to committing rapes over multiple years of college.





DV / 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.

DV / 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

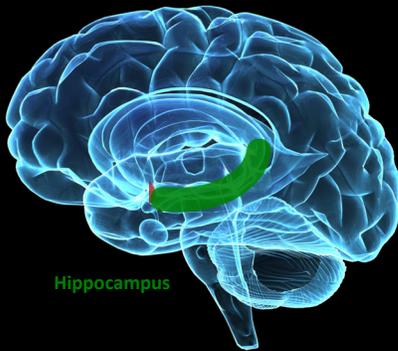
Bottom-Up Attention and Memory

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

Attended = **Central Details** = Encoded



Episodic Memory Circuitry

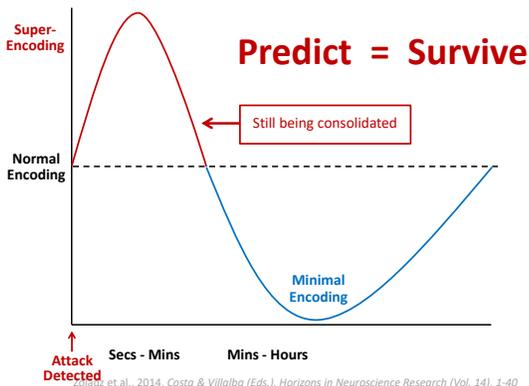




Are you getting the
central details?

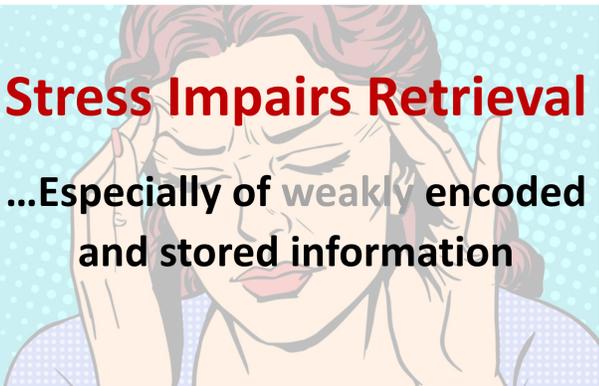
Key moment, when
attack
is detected

Time-Dependent Hippocampus Effects



Are you getting and using **central/early** details?

Stress Impairs Retrieval
...Especially of weakly encoded and stored information



e.g., Schwabe et al., 2012; Neurosci Biobehav Rev, 1740; Smith et al., 2016; Science, 354, 1046

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



e.g., Gilboa & Marlatte, 2017, Trends in Cognitive Sciences, 618-631.

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!**

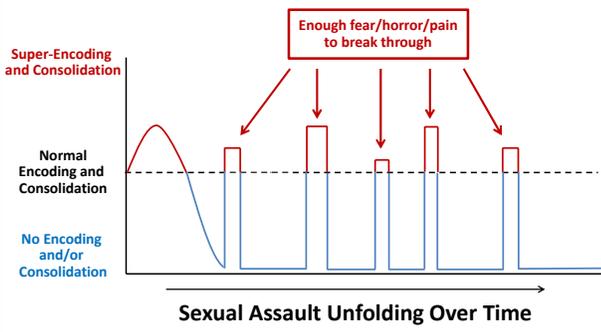


Alcohol and Memory

- **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, 313
Bisby et al. 2009, Psychopharmacology, 204, 655; Bisby et al. 2010, Biol Psychiatry, 68, 280

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



Where there is a **FRAGMENT**
there was usually...

FEAR **HORROR**

PAIN

So **listen** and **explore** for them



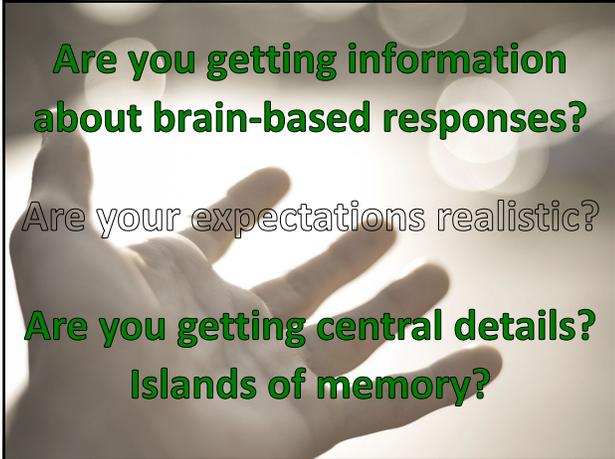
DV / Repeated Assaults

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**



Are you getting information about brain-based responses?

Are your expectations realistic?

Are you getting central details?

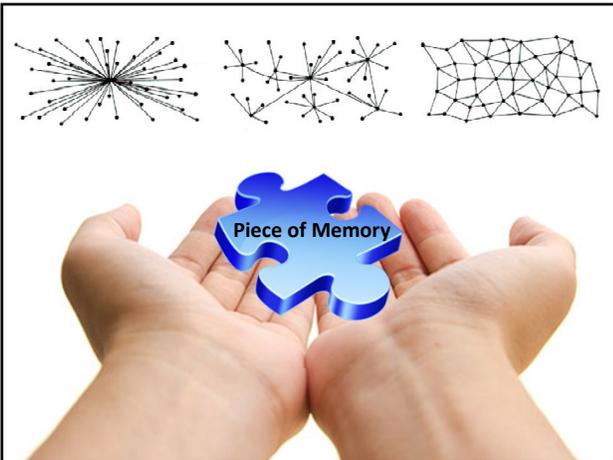
Islands of memory?

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

A colorful funnel is shown, oriented vertically with the narrow end at the bottom. The funnel is divided into six horizontal segments of different colors: red at the top, followed by orange, yellow, green, blue, and purple at the bottom.

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?

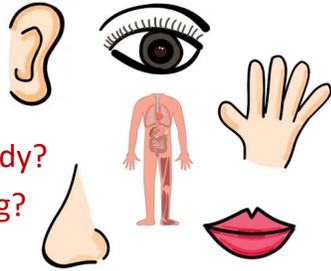
Hearing?

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
