

**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.

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”



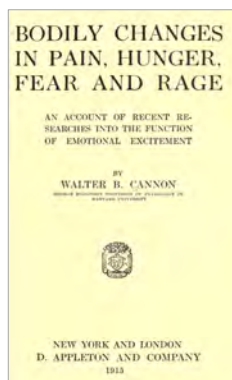
Walter Cannon was a **physiologist**.
He didn't even study behavior.

Confuses physiology and behavior.

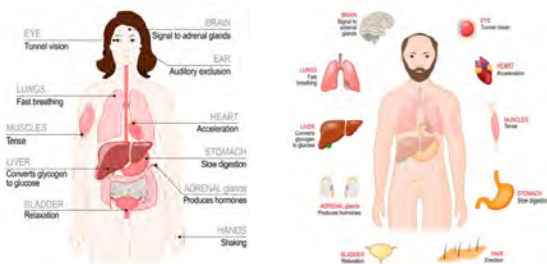
Many people **don't** fight or flee
while being sexually assaulted.

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.

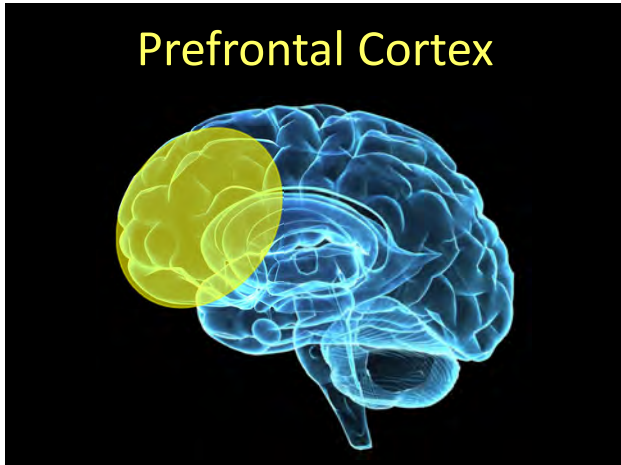
Defense Circuitry



Defense Circuitry in Control

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









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

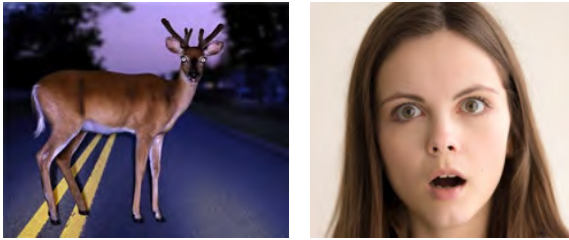
Key moment, when

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..."

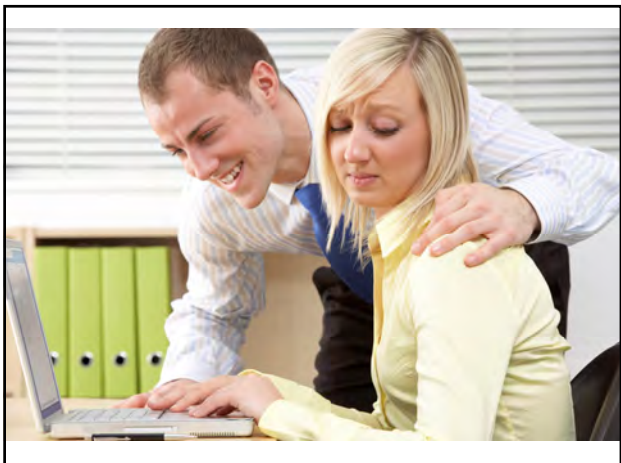
Extremely Passive vs. Extremely Reactive

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

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.

What's Wrong With "Fawn"



Definition of *fawn*

intransitive verb

- 1 : to court favor by a cringing or flattering manner
// courtiers *fawning* on the king
- 2 : to show affection —used especially of a dog
// The dog was *fawning* on its master.

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

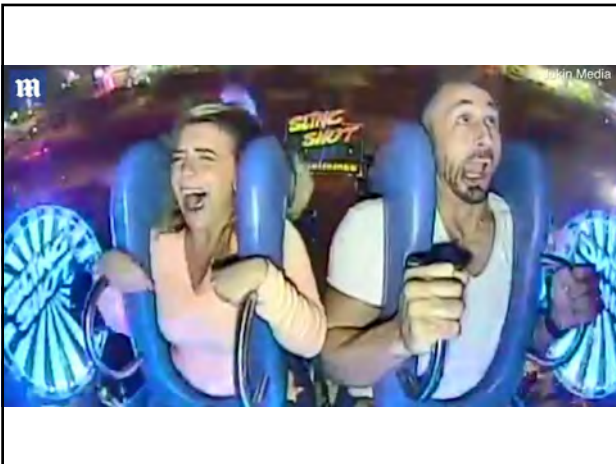


Tonic Immobility

- 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**

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.

Is it a **problem** not to know about tonic and collapsed immobility, and just think “freeze”?

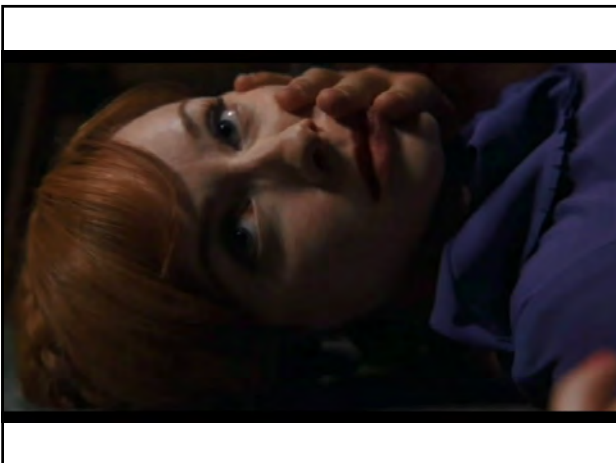
How does knowing that TI and CI are **different survival reflexes** – from freezing and from each other – help you to **listen** better?

To **understand** complainants’ experiences?

Dissociation

Blanked/Spaced Out
Disconnected from Body
Autopilot

53



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

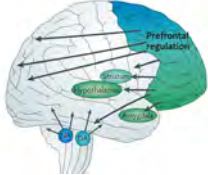
- Tonic Immobility
- Collapsed Immobility
- Dissociation

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





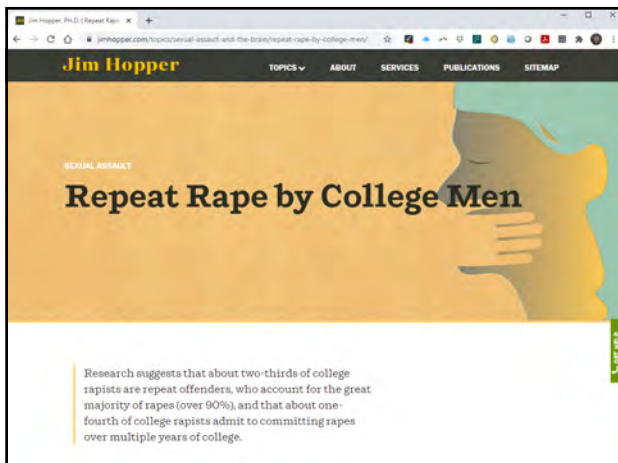
Perpetrator

- 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



Jim Hopper 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.

How Brain-Based Behaviors Tend to Unfold Over Time

Freezing
(scientific def.)

Detection Freezing

- Everything stops
- 1-3 seconds

Shocked Freezing

- Can follow detection
- Blank mind, no behavior options to choose from
- Can last several seconds

No-Good-Choices Freezing

- Can follow detection or shocked
- Only "bad" choices of extremely passive vs. reactive behaviors
- Seconds to minutes

Rational, Utilitarian Behaviors:

- 1. Don't retaliate unless your own well-being is under threat
- 2. Don't retaliate unless you absolutely have to
- 3. Don't retaliate unless you're forced to

Habit Behaviors

- Usually passive and ineffective (no self-defense training)
- Face-saving and submission habits we've all learned
- From gender socialization (e.g., "nice girl" habits)
- From childhood abuse experiences

Extreme Survival Reflexes

Escape (seems) impossible, intense fear and/or horror

Tonic Immobility: Paralyzed, muscles rigid

Collapsed Immobility: Muscles limp, dizzy/pass out

Dissociation: Can kick in early, spaced out and/or autopilot habit behaviors

Potential Overlaps of Dissociation with Freezing, Habit Behaviors, and/or Extreme Survival Reflexes

Detection freezing is very brief (<2 seconds) but it's possible for dissociation to kick in at the same time. Dissociation can continue or start during shocked freezing and no-good-choices freezing (still at the beginning of an assault), especially if the person has dissociated during prior abuse or assault experiences.

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.

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.

Collapsed immobility involves oxygen deprivation, and the resulting faintness or dizziness can be hard to distinguish from dissociative "spacing out." Also, dissociation can happen before and/or overlap with collapsed immobility. However, the passing out of collapsed immobility is very different from dissociation.

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..."
"In shock"	"Begged him not to..."
"Paralyzed"	"Politely pushed him away"
"Couldn't move"	"On autopilot"
"Passed out"	"Gave in"
"Disconnected from my body"	"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

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?

Sexual Assault and Memory

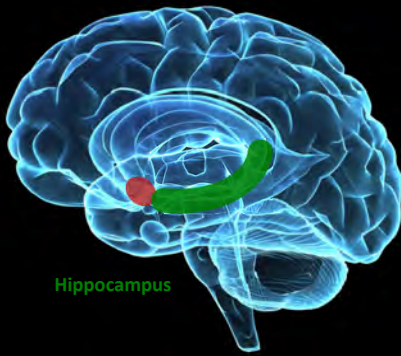
Bottom-Up Attention and Memory

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

Attended = **Central Details** = Encoded



Episodic Memory Circuitry



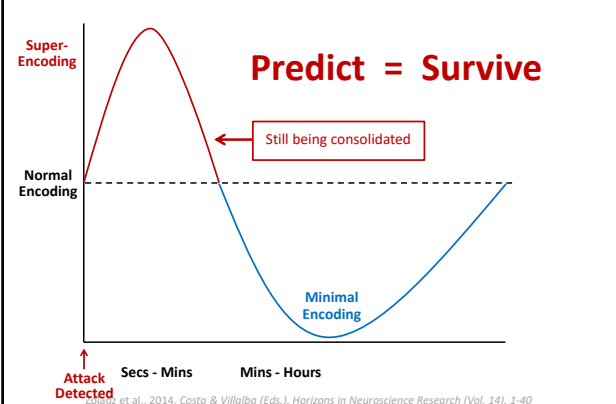
Hippocampus



Are you getting the
central details?

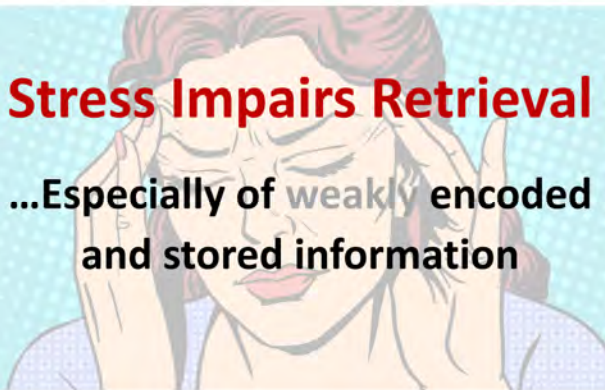
Key moment, when
attack
is detected

Time-Dependent Hippocampus Effects



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

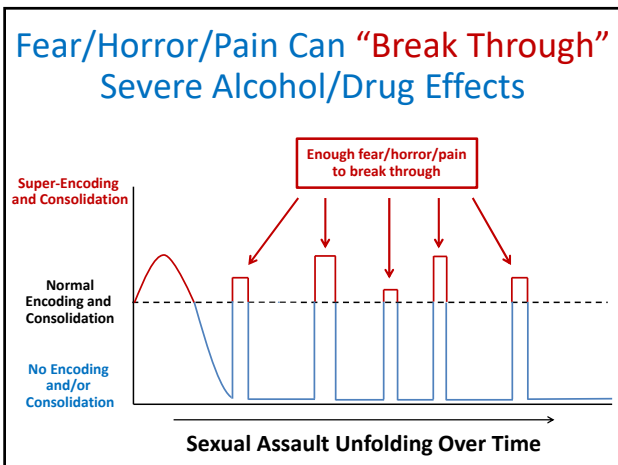
4. Lots of details missing, even some central details? **Gist still there.**
5. More time since assault = More of recall is gist + reconstructed details.
6. **However long ago, central details can be vivid and accurate. Don't miss them!**



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



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

FEAR **HORROR**

PAIN

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



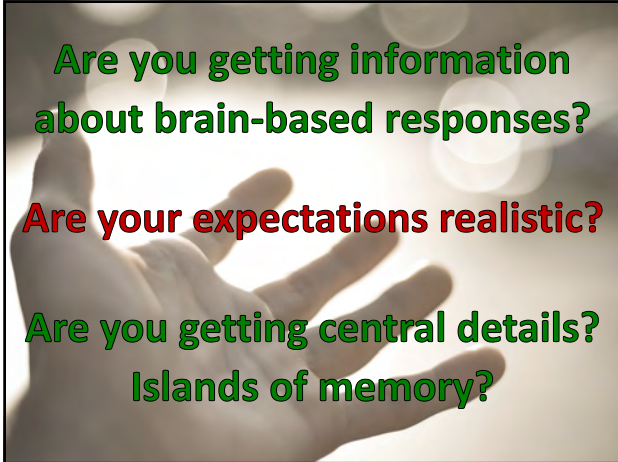
IPV / Repeated Assaults

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





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?

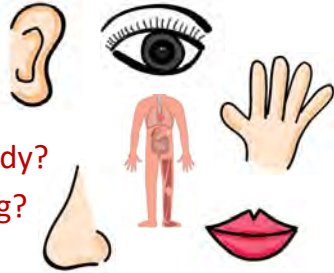
Hearing?

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.”



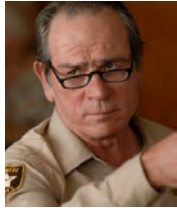
“You mentioned a time when your legs were pinned down. What if anything do you remember thinking then?”

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

The screenshot shows the website for Jim Hopper, Ph.D. The main heading is "Sexual Assault & the Brain". Below the heading, there are several text blocks and a "TRANSLATIONS" section. The text includes questions like "Why don't many people fight or yell when they're being raped?" and "Why are memories of sexual assault so often fragmentary and confusing?". The "TRANSLATIONS" section lists "Español" and "Deutsch". There is also a section titled "REPEAT RAPE BY COLLEGE MEN" with a "Read more" link.

The screenshot shows the YouTube channel page for Jim Hopper, Ph.D. The channel name is "JIM HOPPER, Ph.D." and the bio identifies him as an "INDEPENDENT CONSULTANT, THERAPIST & RESEARCHER". The page shows a "SUBSCRIBE" button and a section for "Created playlists" with five video thumbnails and their titles: "Brief Videos Showing Simple Thoughts of Inspired Methods - Sensibility", "Brief Videos Showing Collapse Sensibility", "Brief Videos Showing Toxic Insensitivity", "Brief Videos Illustrating Memory Principles", and "Brief Videos Showing Survival Reflexes".

The screenshot shows a Psychology Today article titled "Sexual Assault and the Brain". The article is by Jim Hopper, Ph.D. and discusses the brain's response to sexual assault. The main heading is "Sexual Assault and the Brain" and the sub-heading is "Understanding the brain under attack, and implications for justice and healing." The article includes several sections with sub-headings: "Reflexes and Habits" is Much Better Than "Fight or Flight", "Why Christine Blasey Ford Can't Remember How She Got Home", "Why Incomplete Sexual Assault Memories Can Be Very Reliable", and "Why It's Time for Sexual Assault Self-Defense Training".
