Publication & Reporting

The Role that Avoidance & Mental Health Plays in Research Reporting

GCC Rigor & Reproducibility Workshop

5/14/2026

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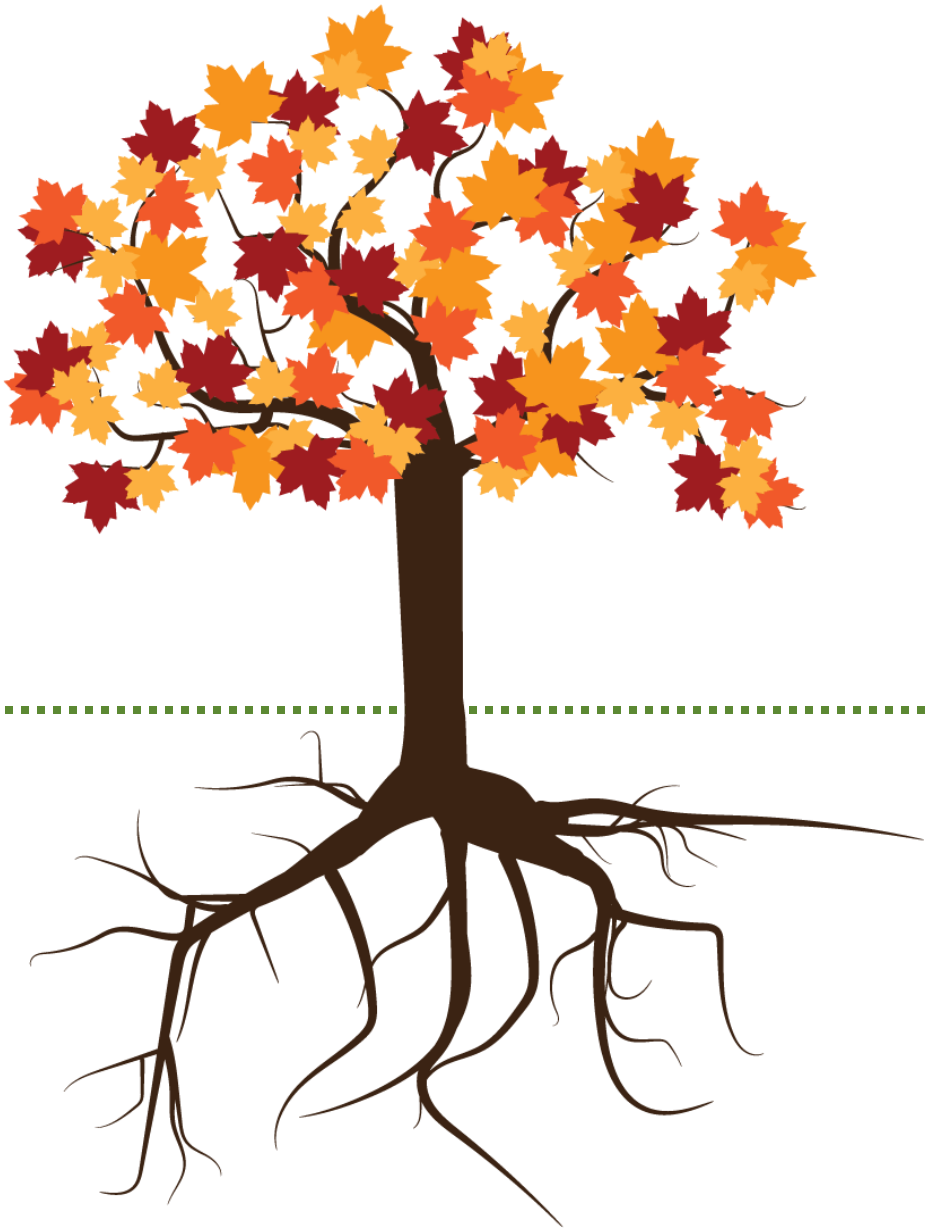
Why do we struggle with Publication & Reporting?

Think about examples in which you personally have struggled with respect to publication &/or reporting in any of your current or past research projects.

The landscape: The Mental Parts of the Research Process

What's visible



MDA SCOARE Training (Best & Miller, 2010; Jake Follmer & Sperling, 2018)

The landscape: The Mental Parts of the Research Process

Self-initiating

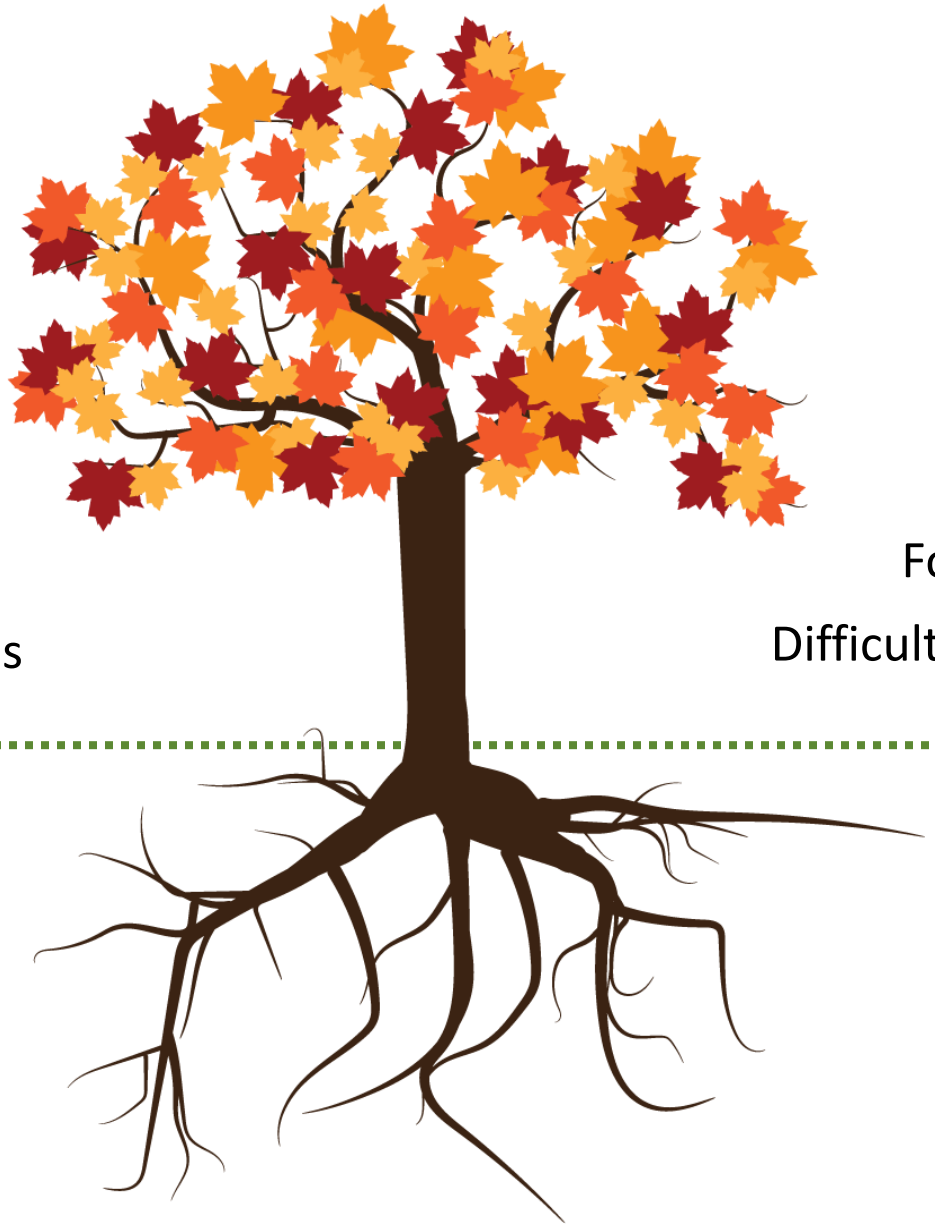
Procrastinating

Flexible/Adaptable

Rigid/Fixed

Focused

Off-topic/rabbit holes



Organized

Disorganized

Unimaginative

Creative

Follows guidance

Difficulty with feedback

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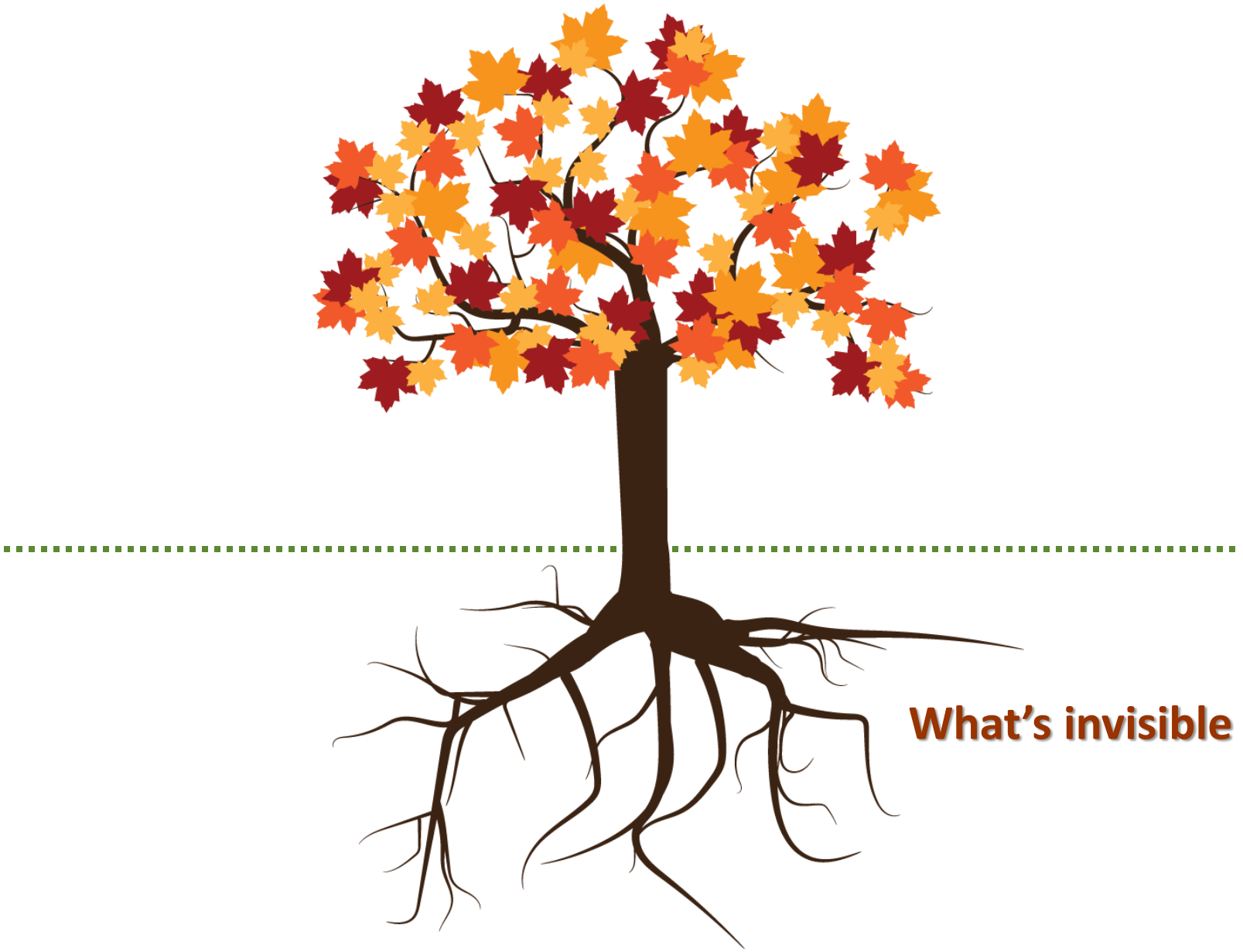

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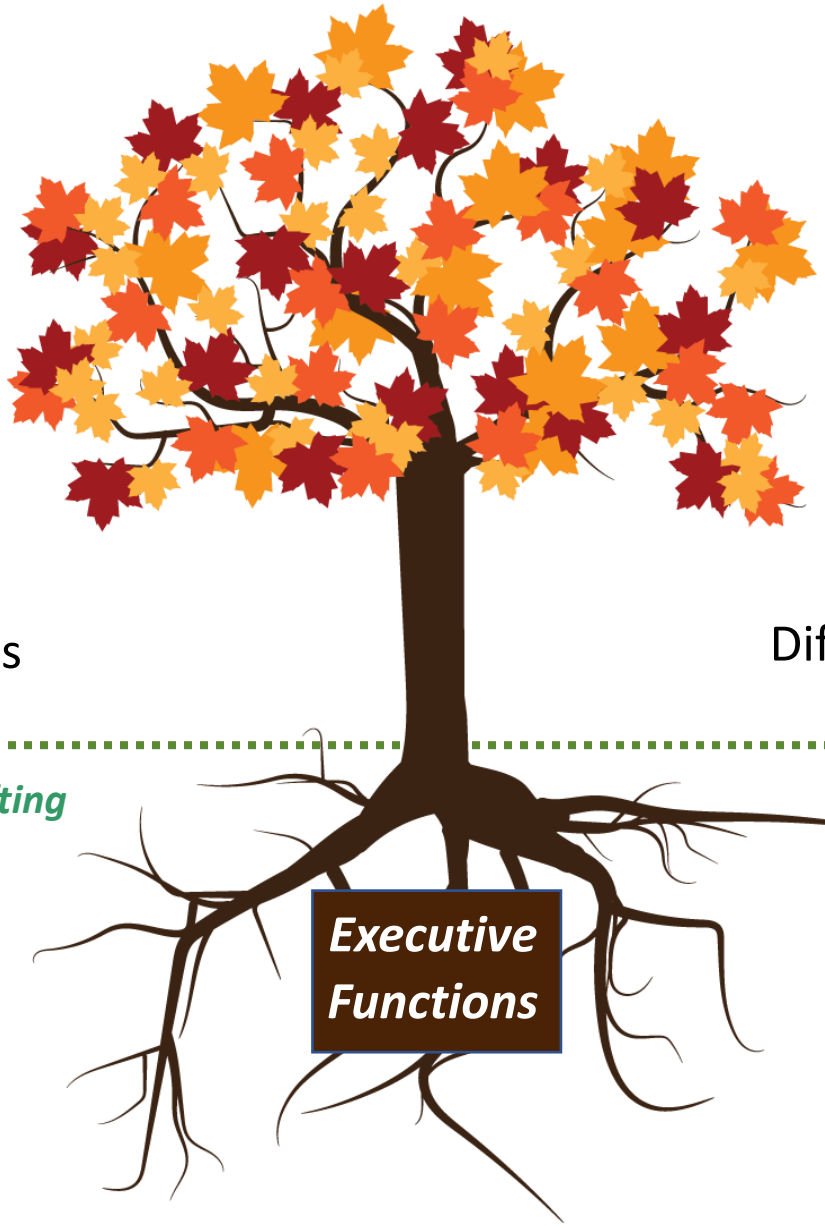

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Cognitive Flexibility/Shifting

Initiation

Working memory

Self-monitoring

Inhibition

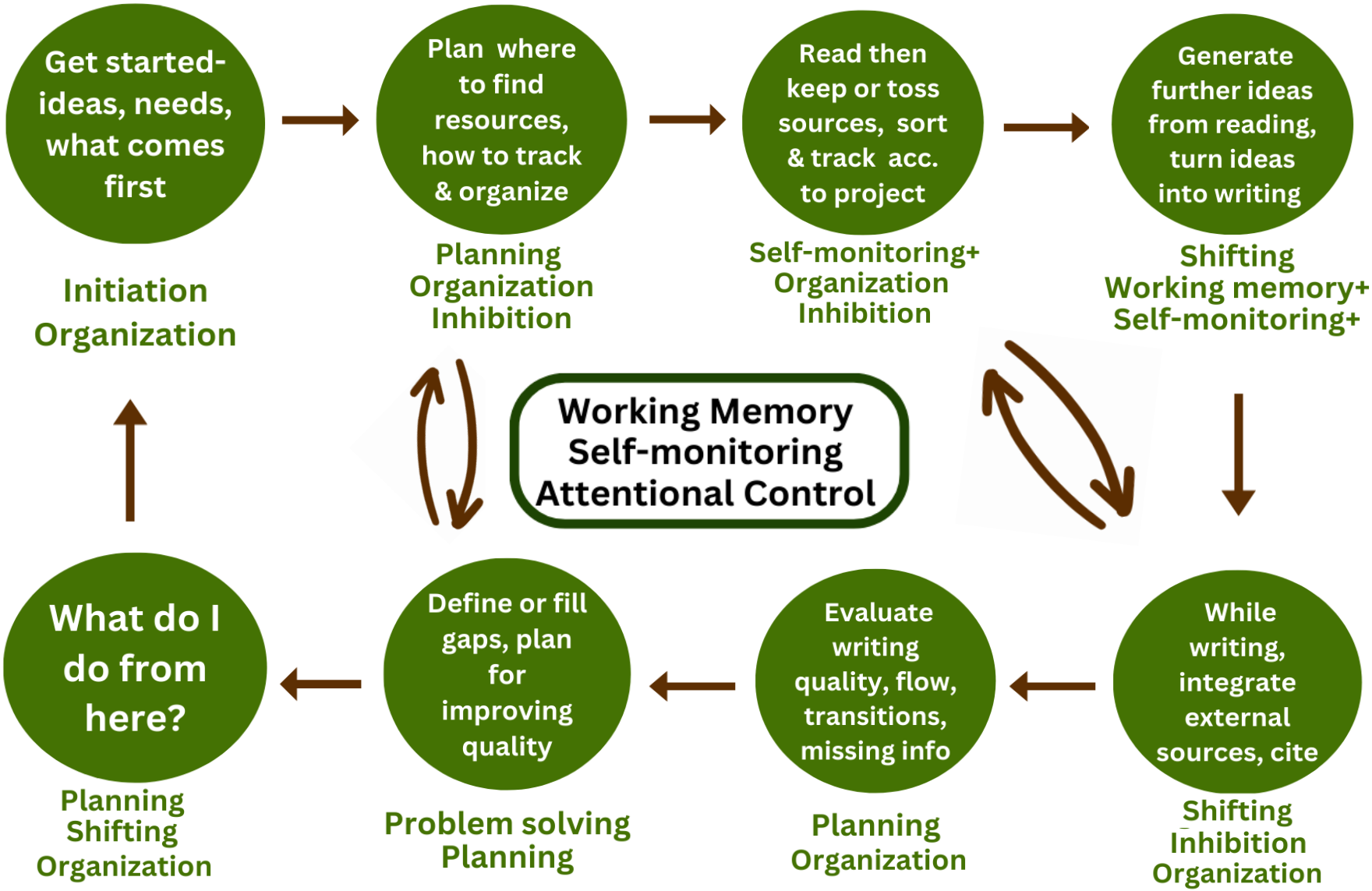
Organization

Planning

Attentional Control

Problem Solving

MDA SCOARE Training (Best & Miller, 2010; Jake Follmer & Sperling, 2018)



MDA SCOARE Training (Best & Miller, 2010; Jake Follmer & Sperling, 2018)

Inhibition / Inhibitory Control

What is it?

- Stopping an action or behavior (before starting, or discontinuing)
- Difficulty in determining and ignoring irrelevant info

What does it look like:

- Research off-topic &/or off-task
- Research tasks behind schedule
- Scientific communication quality suffers
- Can be linked to problems with emotional regulation

Initiation

What is it?

- Getting started on a task
- Increased focus necessary to increase momentum on a task

What does it look like:

- Research tasks behind schedule
- Visible lack of productivity
- Little to show / putting it off tasks / no timetable for progress
- Doing other productive but off-task things instead
- Easily distracted

Organization

What is it?

- Sorting and ordering tasks, things, people, or time
- Either lack of or exhibiting a dysfunctional excess of organization

What does it look like:

- Difficulty locating resources/files
- Mixing up tasks, steps, citations, etc.
- Difficulty estimating time needed for life and work tasks
  - *Chronic lateness / inability to meet deadlines*
- Unable to articulate the plan or where they are in a project

Attentional Control (Focus)

What is it?

- Having to initiate a task/topic & then maintain attention
- Working memory underpins this component of EF, so anyone at any time can be affected
  - *Distractors include: environmental, biological, social, emotional stimuli*

What does it look like:

- After starting, getting lost in the middle
- Getting pulled into related but irrelevant topics or tasks
- Likely to self-identify as not being able to focus

Problem Solving

What is it?

- Addressing an issue in completing the task/goal
  - ***Factors:***
    - *Urgent vs non-urgent*
    - *Internal (i.e. focus) vs external (i.e. few sources)*
- Cognitive flexibility opens up creativity for PS & organization enables PS

What does it look like:

- Getting stuck often, may have difficulty determining options
- May rush and choose less-effective solutions
  - *Unaware or hesitant of solutions*

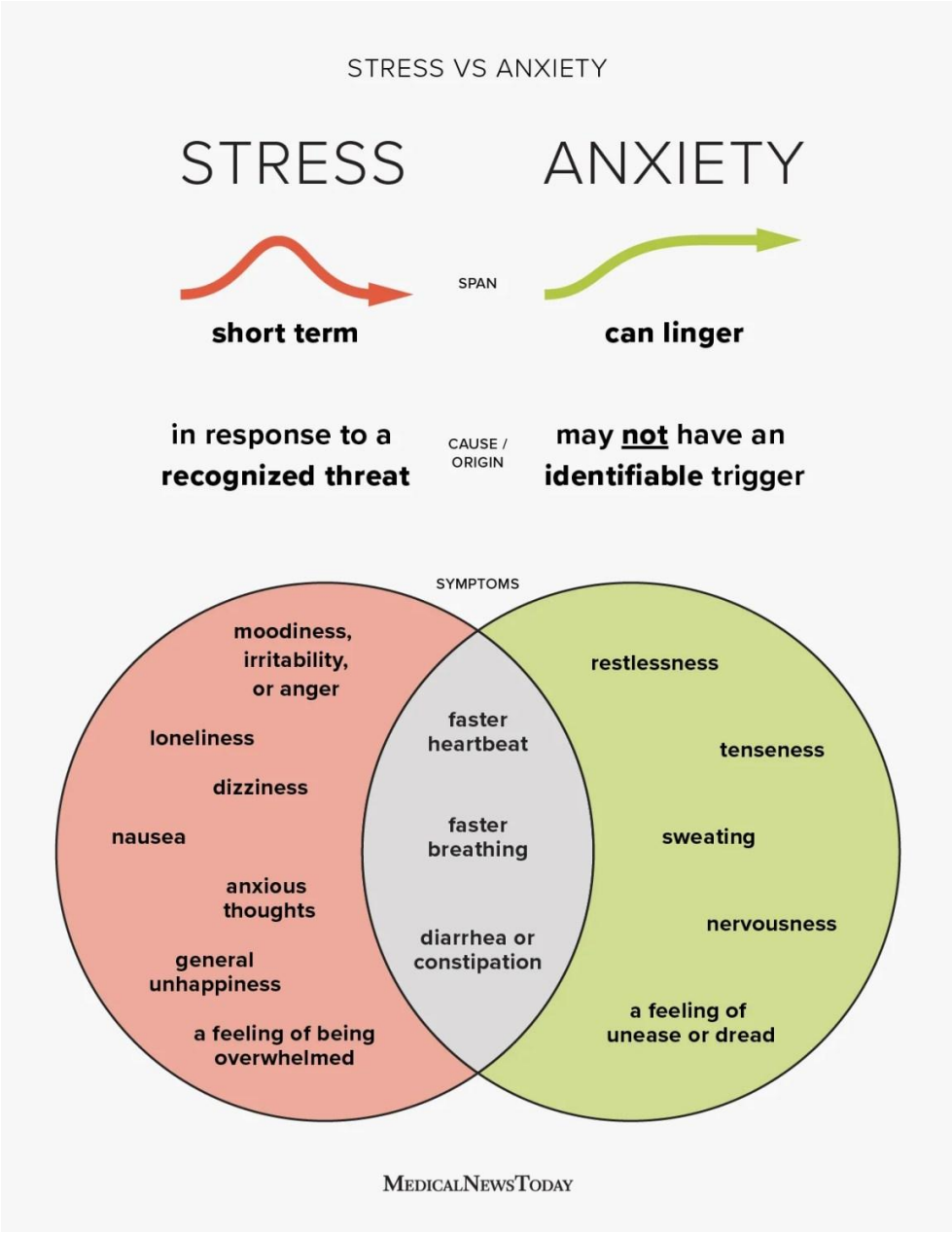
What Impacts Executive Function?

All of the EF components on the previous slides can be directly & negatively impacted by:

- **Mental health**
  - **Most common: Anxiety & Depression**
  - Other diagnoses: Burnout, TBI, ADHD, Autism, Dyslexia
- **High stress &/or chronic stress**
- **Poor sleep**

(Balogh & Czobor, 2016; Borella, et al., 2010; Fabio & Capri, 2017; Held, et al., 2020; Matsuura, et al., 2014; Slife & Weaver, 1992; Smith, et al., 2015; Torenvliet, et. al, 2022)

Is it
Stress
or is it
Anxiety?



The Harris Center Crisis line: **988**

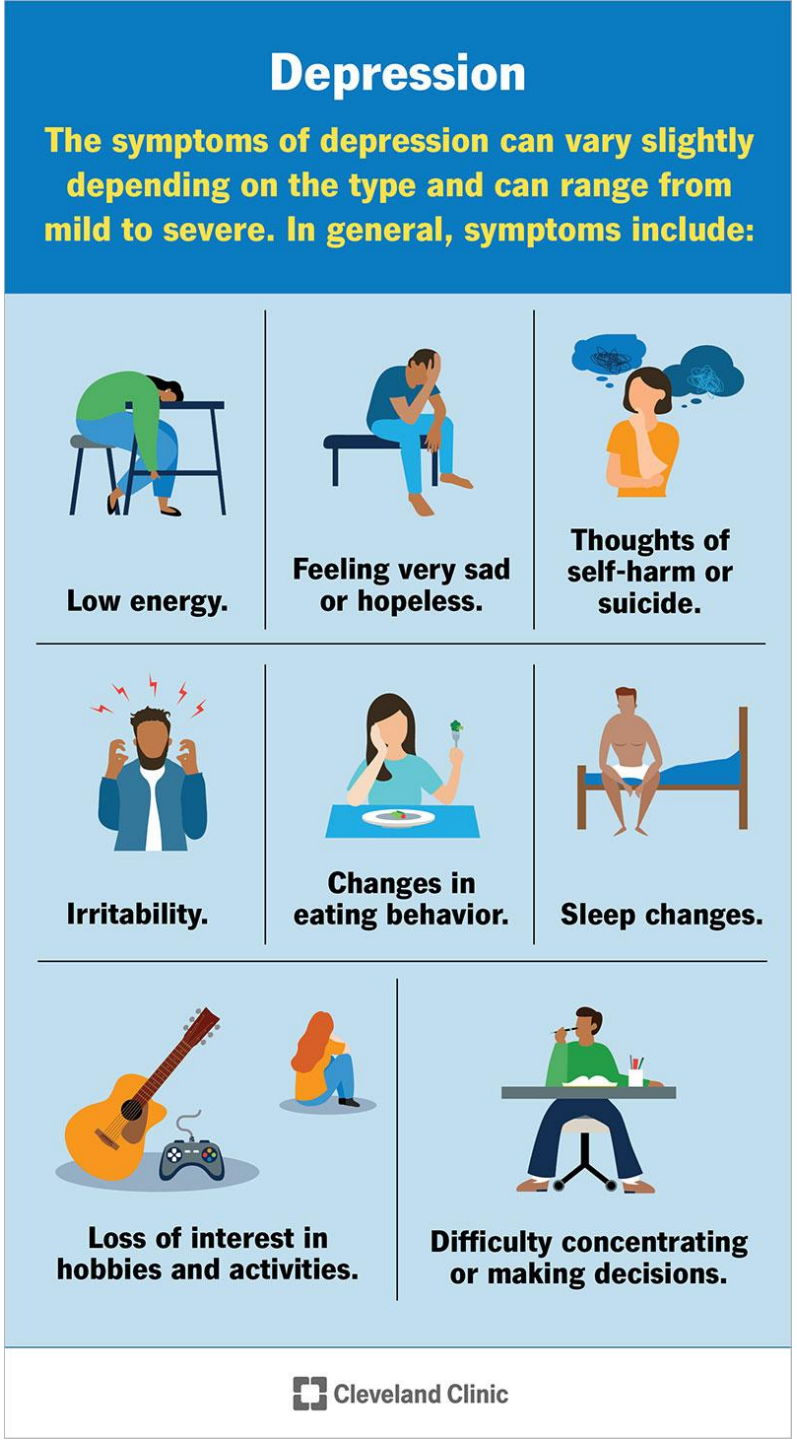
Trainees and Anxiety

- 34.3% of PhD / doctoral / medical students suffer from anxiety
  - Rates up to 65.5% reported in some studies
  - Worldwide… not a phenomenon specific to US & western countries
  - Rates are higher in students from countries with visa concerns

The Harris Center Crisis line: **988**

(Chi, et. al, 2023; Mirza, et. al, 2021)

Is it **Depression**?



The Harris Center Crisis line: **988**

Trainees and Depression

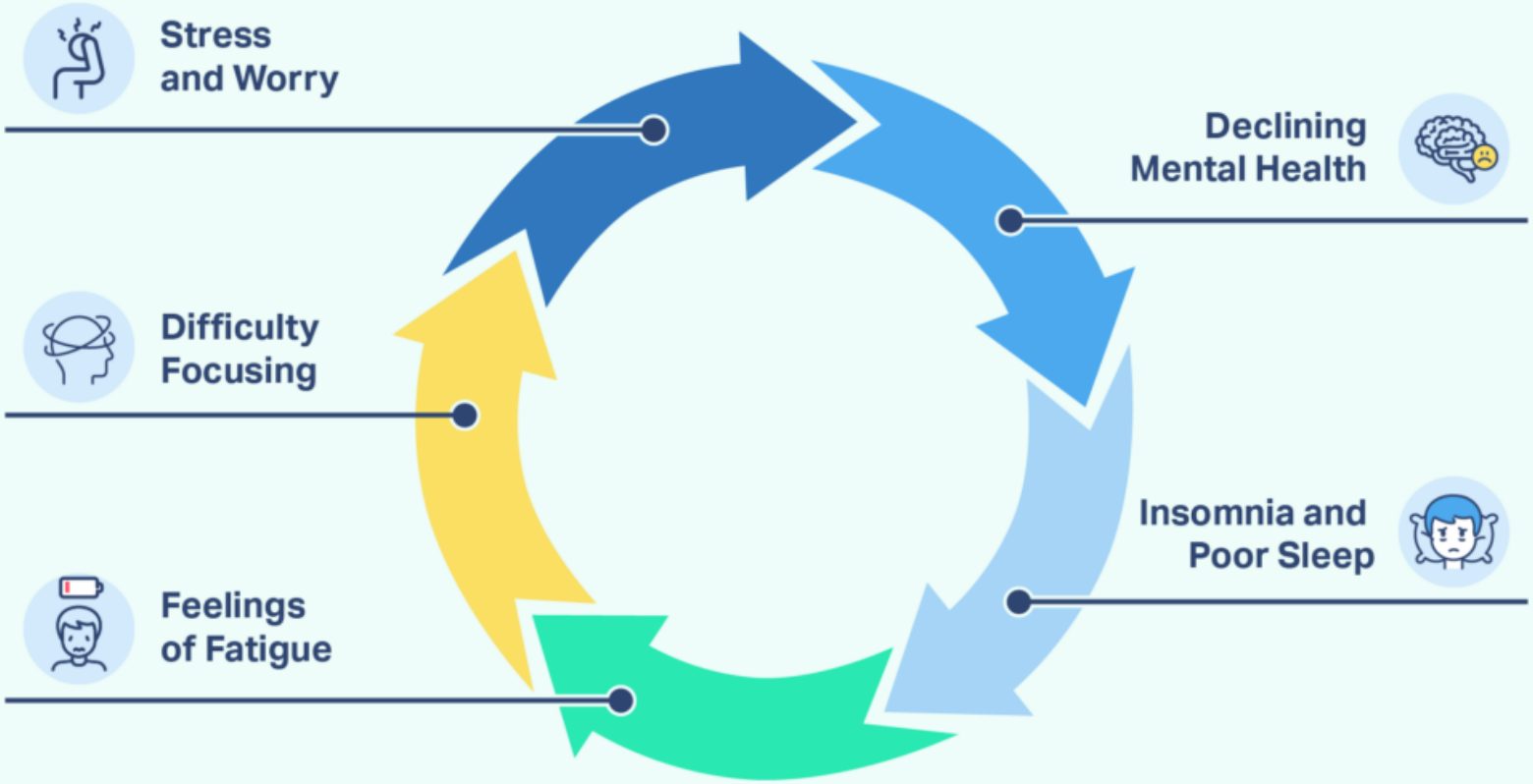
- 33.5% of graduate / medical students suffer from depression
  - Rates up to 73.5% reported in some studies
  - Worldwide
  - Incidence is higher than the general population
  - Incidence is higher in certain regions (Middle East & USA)

The Harris Center Crisis line: **988**

(Chi, et. al, 2023; Mirza, et. al, 2021)

Sleep and Mental Health

A negative feedback loop can worsen sleep *and* mental health.



https://www.sleepfoundation.org/mental-health

American Heart Association.
Healthy for Good™

Life's Essential 8™

HOW TO GET HEALTHY SLEEP

Getting a good night's sleep every night is vital to your heart and brain health.

ADULTS SHOULD AIM FOR AN AVERAGE OF 7-9 HOURS

Babies and kids need more depending on their age.

LEARN THE BENEFITS OF SLEEP

- **BETTER BRAIN FUNCTION** including alertness, decision-making, focus, learning, memory, reasoning and problem-solving
- **IMPROVED** mood and energy
- **STRONGER** immune system
- **HEALING** and repairing of cells, tissues and blood vessels
- **LESS RISK** of chronic disease

LEARN HOW SLEEP AFFECTS YOUR HEALTH

Sleep is an important time for your brain to reset. Regular, restful sleep is important to keep your brain running smoothly. Poor sleep may put you at higher risk for:

- Depression and anxiety
- Memory loss and dementia
- High blood pressure, blood sugar and cholesterol
- Obesity
- Heart disease

Learn more at heart.org/lifes8

TIPS FOR SUCCESS

Check your room

DIM IT.

Dimming the lights before sleep helps signal to your brain that it's time to wind down. Dim your screen or use a red filter app at night. The bright blue light of most devices can mess with your "internal clock" and melatonin production, a hormone that regulates sleep.

SET IT.

Go to bed and wake up at the same time every day. This helps regulate your body's internal clock and makes it easier to fall asleep and wake up naturally. Set a bedtime alarm to remind you it's time to wrap it up for the night.

CREATE IT.

Establish a nighttime routine. Spend 20-30 minutes winding down before bed, such as reading, meditating, or taking a warm bath. Avoid screens.

BLOCK IT.

Put your phone on "do not disturb" mode to block it all out when you're trying to sleep.

Approach & Avoidance

Stress: the body's reaction to any demand or pressure, whether physical or emotional.

Approach-avoidance refers to the tendency to either move towards or away from a stimulus or situation. This can be influenced by stress.

Approach Behaviors:

These involve actively confronting a situation, seeking solutions, or engaging with a potential reward.

Avoidance Behaviors:

These involve withdrawing from a situation, suppressing thoughts, or seeking distance from a potential threat.

What is Avoidance - Motivated Behavior?

3 main types of behaviors:

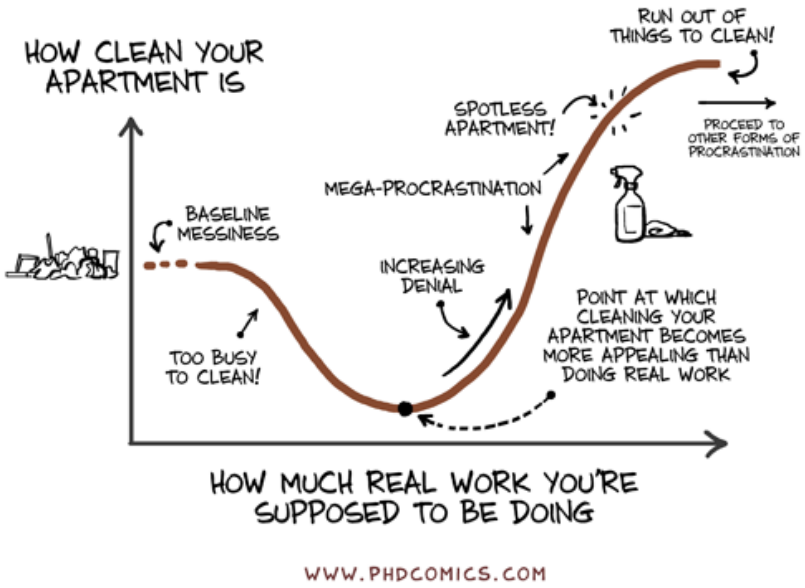
- ***Complete Avoidance***
  - *No showing at a presentation, Failure to submit documents, Quit a responsibility*
- ***Escape***
  - *Leaving early from a commitment, Ending a talk abruptly, Hiding in one's office*
- ***Partial Avoidance***
  - *Daydreaming, Avoiding eye contact*

- ***These behaviors do not reduce anxiety, rather they can fuel it or cause difficult situations to "snowball".***

What is Avoidance - Motivated Coping?

We do something else instead to bring momentary relief

#1 way….Procrastination



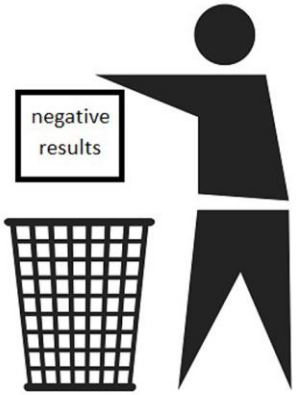
Why exhibit avoidance behaviors in P&R?

FEAR

- Fear of Failure

Pressure

- Pressure to have high impact publication(s)
- Lab/Peer Pressure
- Visa/Employment Pressure

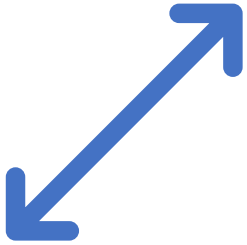


Underlying issues in avoidance behaviors (P&R)

Difficulty with Time Management

Administration & writing can take a significant amount of **time away** from **productivity**

P&R deadlines can create **time conflicts** with other commitments (family, teaching, service, travel, …)



"Lack of Progress"

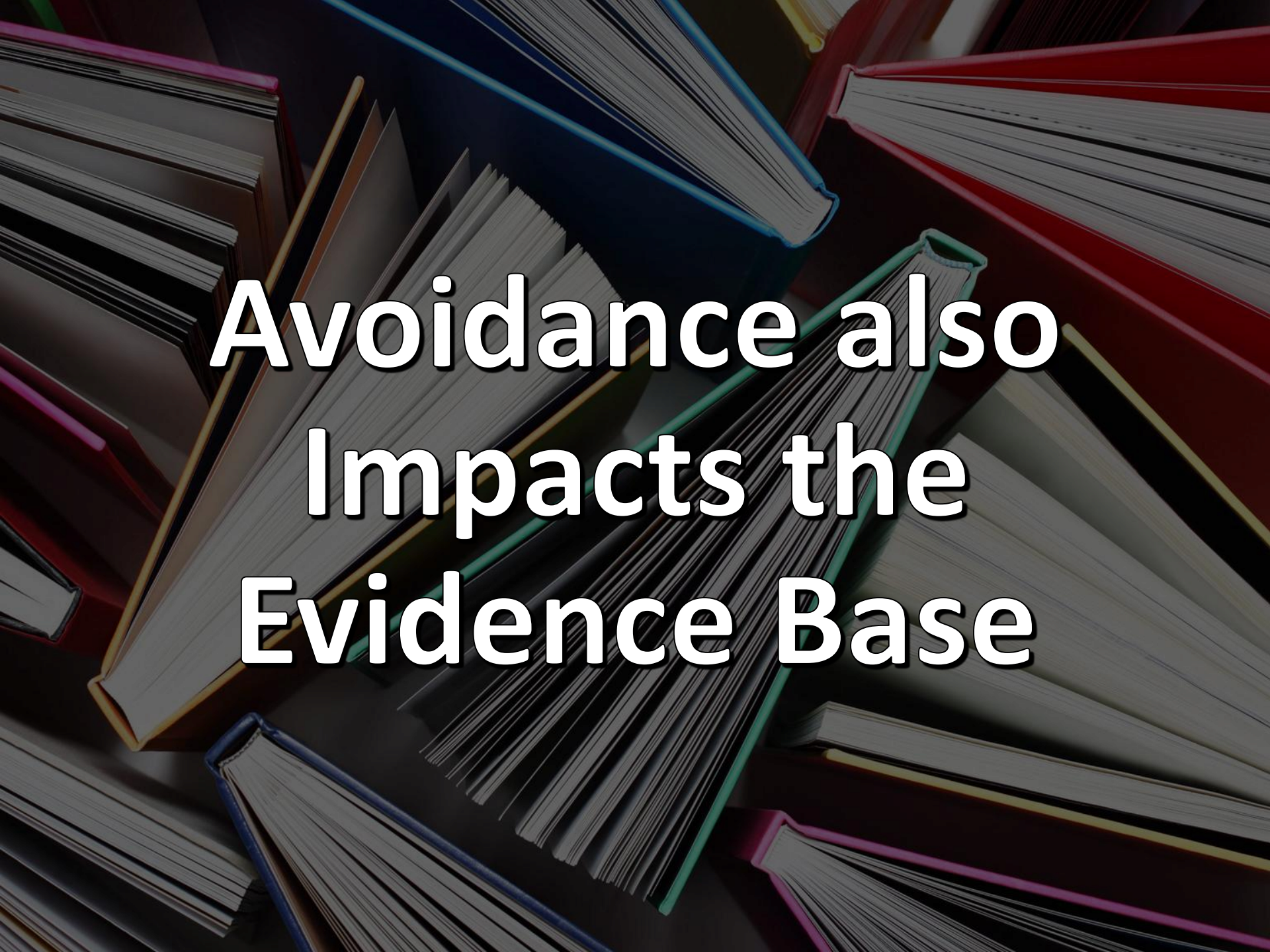
Often, we feel like we have not been **productive enough**… which can be paralyzing

Difficulty in acquiring needed info (e.g., ambiguous documentation)

Progress can feel like a moving target

Avoidance Impacts our Professional Lives

- Missed Deadlines
- Delayed Publications
- Late Reports to Regulatory & Funding Entities
- May Impact Promotion & Tenure, Career Advancement


Avoidance also
Impacts the
Evidence Base

Publication & Products of Research

Most commonly sought products of research

- Peer-review publications in top-tier journals
  - *May require open access agreements for data produced (federal mandates)*
- Conference papers / podium presentations
- Abstracts / conference posters
- Technology Development &/or Techniques
- Inventions: Patents, patent applications (NPA, PPA), licensing agreements

Publication & Products of Research

Who does the work?

- PI / Co-Is are typically senior authors
- Post-docs, Research Assistants
- Graduate Students, possibly Undergrad students
- Lab Techs

Typically, these are team efforts which the PI supervises

- PI can ideally spend time to other projects and commitments
- Majority of work likely done by junior scientists / trainees***
- *Avoidance behaviors exist @ all levels of science*

Research Reporting Types

Common types of reporting in research

- Department/Center/University Annual Reports
- IRB / Human Subjects Protection
- IACUC / Animal Research Oversight
- Federal Regulatory Bodies (eg. FDA)
- **Funding / Grants**
  - Federal (NIH, NSF, etc)
  - State (CPRIT)
  - Local (Dunn Foundation)
  - Private Foundations (AHA, ADA, etc)

Research Performance Progress Reports (RPPRs)

Federally mandated format required by NIH

- Similar formats & information required by other funding bodies
- Typically done on an annual basis

Only the PI or a noted delegate can initiate

- This can require a major time & resource commitment by the PI
- Majority of work likely done by PI
- *PI may have to formally submit the document to the funding body & institution*

Does your institution have administrative resources to help you with this?

- Ask your administrative staff about this!!!

RPPR Required (Core) Components

- Accomplishments
- Publication & Products
- Patient &/or Animal Recruitment & Safety Reports
- Collaborative Efforts
  - Details on project personnel
  - Multi-site projects
- Impact (NSF)
- Project Changes, Challenges, & Problems
  - Modifications to Protocols
- Financial Reports & Budget Changes
  - Rationale for alterations

What about reporting standards for manuscripts?

Are there core reporting standards for manuscripts?

What about grant applications?

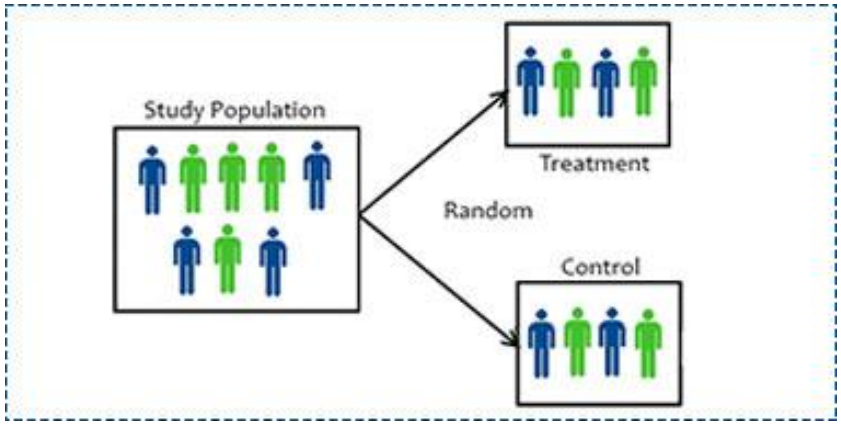
Manuscript Core Reporting Standards

1. Randomization

- Animals &/or human subjects should be assigned randomly to the various experimental groups, and the method of randomization reported.

2. Blinding (single, double, etc.)

- Allocation concealment
- Blinded conduct of the experiment
- Blinded assessment of outcome



Landis et al. 2012 - Nature

Manuscript Core Reporting Standards

3. Sample Size & Estimation

	Measure	units	Control	Patient	α	Power	n / group
Aim 1	CV Score[12]	--	0.10 ± 0.09	0.21 ± 0.09	0.05	80%	14
	DFA Score[19]	--	0.89 ± 0.04	0.96 ± 0.04	0.05	80%	7
	Response Time[12]	ms	926.8 ± 63.7	1021 ± 72.9	0.05	80%	10
	Accuracy[12]	%	78.1 ± 14.6	60.3 ± 10.4	0.05	80%	10
Aim 2	**Age at Diagnosis[16]**	years	**51.32 ± 6.02**	**43.45 ± 10.82**	**0.05**	**80%**	**21**
Aim 3	BMI[16]	kg/m^2	26.52 ± 6.79	33.78 ± 5.58	0.05	80%	13
	Cholesterol[15]	mg/dL	58.76 ± 14.25	35.83 ± 11.16	0.05	80%	17

4. Data Handling

- Outliers
- Endpoints (primary, secondary)
- Missing data
- Replicates

Hurtles to P&R?

Project Changes, Challengers, & Problems

- **Difficulties in starting &/or running a project**
  - *Instrumentation, Participants, Lab Staff, Time, Funding, …*
  - *Lack of progress due to such difficulties*

Difficulty organizing required information by stated deadlines

- Time conflicts, communication challenges, …

Little to no institutional support

- Some PIs need to fill out the report and submit it in its entirety
- A ***lot of time*** can be devoted to understanding what info is required, especially without administrative support

Lack of P&R means that biases can be introduced into the evidence base

Reporting Bias

- Selective revealing (or suppression) of information/outcome of a study
- “Spinning” of unexpected or undesirable results

Citation & Location Biases

Time Lag Bias

Language Bias

Funding Bias

- Tendency of a scientific study to support the interests of the study's financial sponsor
- Predetermined conclusions may bias researchers into an expectation bias / outcome reporting bias

Strategies in Addressing Bias in P&R

Don't withhold critical information

Discuss authorship & team expectations early on in the process

Be organized

May need to reprioritize

Set realistic goals for yourself and your team

COMMUNICATE:
If you are a team leader/PI and you *detect excessive stress* in one of your team members, it is generally better to check in with that team member than try to wait it out.

Strategies in Addressing Bias in P&R (Considering Federal Mandates)

Use ALCOA Principles for Managing Data Quality

- **A**ttributable
- **L**egible
- **C**ontemporaneous
- **O**riginal
- **A**ccurate

Maintain Data Integrity

- **C**omplete
- **C**onsistent
- **E**nduring
- **R**eadily Available

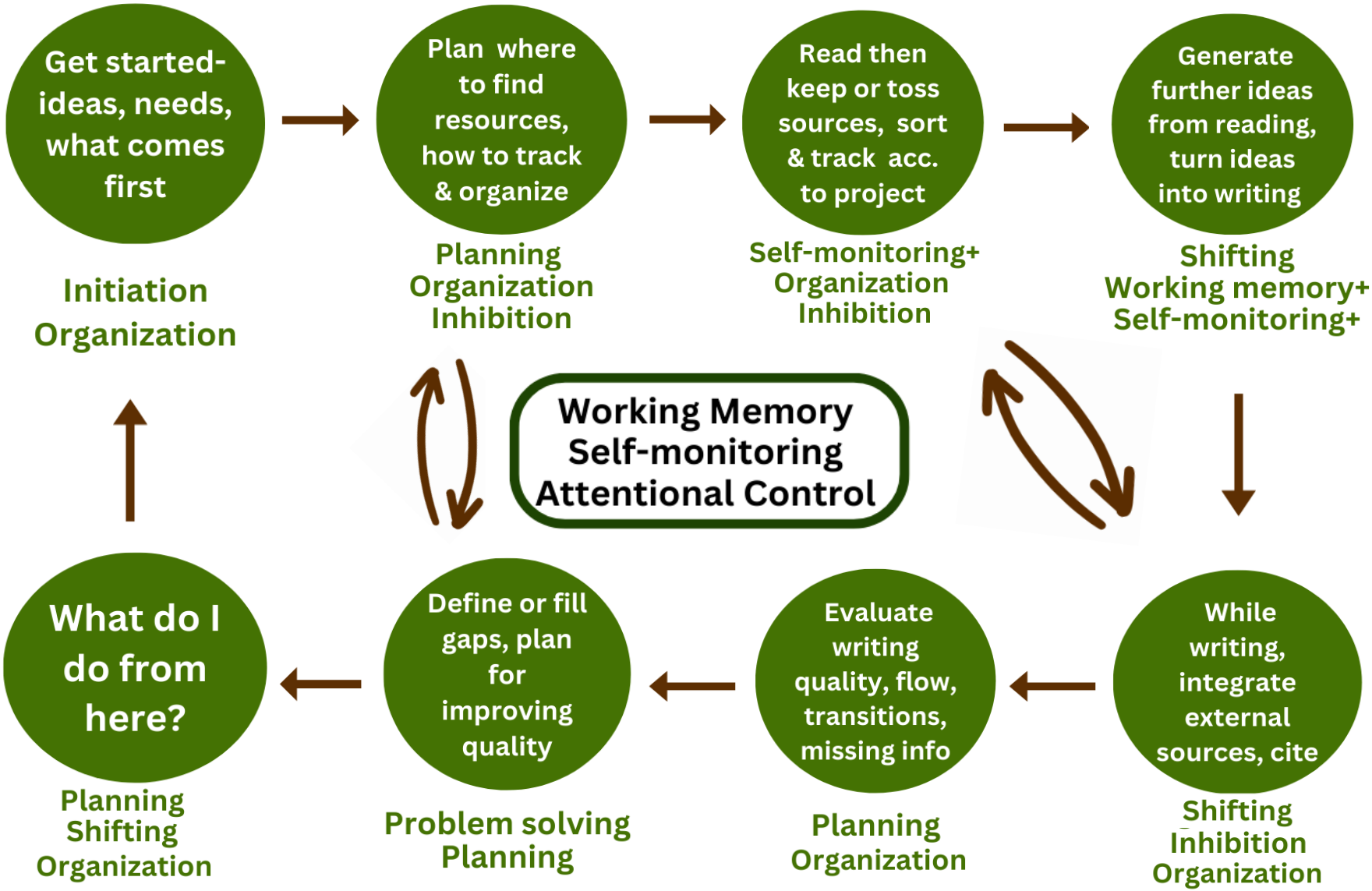
Strategies in Addressing Bias in P&R

Have	… a clear achievable goal for yourself and your team
Reflect	… on the strengths & weaknesses of you and your team
Know	… your resources
Be Clear	… on your deadlines & the roles of each team member working towards
Familiarize	… yourself with expectations of editors, review boards, funders, & your institution

Which root is the issue?

In small groups, reflect on which of the executive functions contribute to the trainee struggles with publication and reporting described in the case studies.

What strategies can be used to overcome these struggles?



MDA SCOARE Training (Best & Miller, 2010; Jake Follmer & Sperling, 2018)

Case Study: Jason

- Jason is a first-year graduate student in a biotechnology program, focusing on gene-editing applications. He’s passionate about innovation and often has bursts of creative energy, especially when brainstorming new project ideas or exploring emerging technologies.
- In lab meetings, Jason frequently interrupts others when he gets excited about a topic or wants to challenge a point. He often speaks before fully processing the conversation or considering the implications of his comments. While his ideas are usually insightful, this habit sometimes disrupts group discussions and frustrates his labmates, who feel he doesn't always listen fully before reacting.
- During lab work, Jason often finds it difficult to follow protocols step-by-step without skipping ahead or trying out untested shortcuts. Recently, he attempted to adjust a reagent concentration mid-experiment without consulting his supervisor, believing it might improve results. The experiment failed, and when questioned, Jason admitted he deviated from the protocol. His supervisor emphasized the importance of following validated procedures and resisting the urge to improvise prematurely.
- While reading dense journal articles for a literature review, he finds himself impulsively switching tabs to read about unrelated biotech startups or messaging classmates about new tech developments. He has difficulty resisting immediate curiosities or distractions, even when he’s set time aside for focused work.
- These patterns have started to affect his progress and reputation in the lab. **What executive function do you think Jason struggles with and what strategies could potentially help him?**

Case Study: Maya

- Maya recently joined a molecular biology lab that studies gene expression in neural stem cells. Although she is capable and genuinely excited about her research, Maya often finds herself staring at her computer or lab bench, unsure of how to start her daily work.
- Each morning, Maya intends to begin analyzing her RNA-seq data, but instead, she gets caught up responding to emails or organizing files — tasks that feel productive but are actually forms of procrastination. When it comes to starting new experiments, she feels overwhelmed by the complexity of protocols, worries she'll make mistakes, and waits too long for her PI or lab mates to confirm steps she likely already understands.
- Her notebook is full of detailed notes from meetings and literature, but translating those notes into action — like designing primers or drafting a figure — takes her much longer than expected. She's afraid of starting the "wrong way" and ending up with failed experiments or wasted time.
- Her PI has begun to notice that while Maya is always busy, her progress is slower than that of her peers. Maya, meanwhile, feels frustrated and disappointed in herself, unsure why it's so hard just to *get started* — even on things she knows how to do.
- **What executive function do you think Maya struggles with and what strategies could potentially help her?**

Case Study: Alex

- Alex is a 3rd year engineering graduate student working on designing low-power sensor circuits for wearable health monitors. Alex's lab bench is cluttered with wires, datasheets, partially assembled boards, and sticky notes. When their advisor asks for a schematic or a recent power measurement, Alex often scrambles to find the right file, not remembering whether it's in the cloud, on their laptop, or buried in an email thread. They use multiple notebooks inconsistently, and some experimental notes are on their phone or in random Word documents.
- In terms of project planning, Alex struggles to track multiple timelines. They're juggling:
  - A prototype deadline for a conference paper.
  - Weekly tasks for their teaching assistantship.
  - Three graduate-level courses with overlapping assignment due dates.
- Because there's no unified calendar or task system, they frequently miss lab meetings or show up to meetings unprepared. They start working on tasks that seem urgent but neglect the important ones, like updating documentation or responding to collaborator feedback.
- Their advisor is supportive but frustrated by inconsistent updates and late deliverables. When asked about progress, Alex gives vague responses, not because they're slacking, but because they genuinely don't have a clear overview of their own project timeline.
- **What executive function do you think Alex struggles with and what strategies could potentially help them?**

Case Study: Sara

- Sara is a 3rd year graduate student in a neuroscience program, currently working on her dissertation. Her topic is complex and involves both experimental data analysis and a thorough literature review. She's motivated but has been falling behind on her deadlines.
- Lately, Sara has noticed that she struggles to maintain focus for more than 15–20 minutes at a time. Each morning, she sets clear intentions to write or analyze data, but as soon as she sits down at her computer, she finds herself checking emails, browsing academic Twitter, or even cleaning her apartment — anything but her dissertation. Even when she starts working, small interruptions (like a text message or an unrelated thought) completely derail her train of thought, and she struggles to re-engage with the task.
- Sara also finds Zoom lab meetings exhausting, as she often zones out during long discussions and misses important details. She sometimes rereads the same paragraph multiple times without absorbing the content, especially when reading dense research papers.
- She's beginning to feel overwhelmed and guilty, believing she's falling behind her peers. **What executive function do you think Sara struggles with and what strategies could potentially help her?**