A Research Mindset

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Defining A Research Mindset
A Research Mindset

1. Examine and counter my biases
2. Learn to innovate technically
3. Learn from failures & creating emotional resilience
Concepts

- Cognitive bias, curiosity, and creativity
- Flexible optimism for perseverance
- Growth Mindset
Part 1
Dealing with Bias
Bias

A **cognitive bias** is a pattern judgment, which humans need to function and **at the same time** leads to illogical conclusions.

Bias arises from various processes and are difficult to distinguish:

- use of information-processing shortcuts (heuristics, generalizations)
- mental noise
- the mind's limited information processing capacity
- emotional and moral motivations
- social influence
- lack of curiosity
Example Biases

Stereotypes
Survivor
Anchoring
Confirmation
Exposure & Recency
Attention (repetition)
Conservative (Bayesian)
Gamblers’ fallacy

Authority
Bandwagon
Dunning-Kruger effect newbies overestimate, experts underestimate
Framing
Von Restorff effect remember surprises
Curse of Knowledge
Congruence (one hypothesis)
Example Biases

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CREATIVE THINKING
“OUTSIDE THE BIAS BOX”
Example Biases

Stereotypes
Survivor
Anchoring
Confirmation
Exposure & Recency
Attention (repetition)
Conservative (Bayesian)
Gamblers' fallacy
Authority
Bandwagon
Dunning-Kruger effect

CREATIVE THINKING
“OUTSIDE THE BIAS BOX”
Slow Down, Be Curious,
Examine your Biases
Part 2
Learn to Innovate Technically
Easier to Innovate if:

1. You can identify the need for it
2. You ask WHY
3. You are good at asking WHY and answering
4. You love what you do

Examples!
Part 3
Dealing with Failures
+ Cultivating Resilience
Real Life is Unpredictable

World events
Local events
Family & Friends
Relationships
Health
good / bad
## Research Events Are Predictable

<table>
<thead>
<tr>
<th>Event</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have ideas</td>
<td>good / bad</td>
</tr>
<tr>
<td>Work on ideas</td>
<td>succeed / fail</td>
</tr>
<tr>
<td>Discuss ideas informally</td>
<td>well / poorly</td>
</tr>
<tr>
<td>Write up ideas</td>
<td>well / poorly</td>
</tr>
<tr>
<td>Submit paper</td>
<td>accept / reject</td>
</tr>
<tr>
<td>Give talk / teach class</td>
<td>well / poorly</td>
</tr>
<tr>
<td>Receive feedback</td>
<td>positive / negative</td>
</tr>
<tr>
<td>Receive structured feedback</td>
<td>positive / negative</td>
</tr>
</tbody>
</table>
Exercise I
Exercise I
Write down how you did or would interpret these events

1. Permanence (time & space)
2. Personalization (you or not you)

   I. Your paper gets accepted
   II. Your paper gets rejected
Keeping Positive

• learn and execute strategies to overcome failures and obstacles

• learn and execute emotional resiliency strategies to manage myself in times of stress and failures
Optimism vs. Pessimism

- **Optimists** believe bad events are temporary setbacks, single events, not my fault, and can be countered with action.

- **Pessimists** believe bad events are permanent, my fault, but not under my control. Leads to inaction.

  - Optimism can be learned!
  - Optimism is a bit of a biased view of reality
  - Optimism is not always better than pessimism.
Explanatory Style

1. Permanence (time and space)
2. Personalization (you or not you)
Permanence (time & space)

Optimistic
Good events have permanent general causes
Bad events have temporary causes / specific to situation

Pessimistic
Good events have temporary causes
Bad events have permanent causes / specific to situation
Personalization

Optimistic
Good events caused by me & other factors
Bad events caused by circumstances, luck, others

Pessimistic
Good events by circumstances, luck, others
Bad events caused by me
Revisiting the Research Mindset
Fixed versus Growth Mindset

Fixed Mindset
  I am smart or not
  I am athletic or not
  I am empathetic or not … etc.
  Success is because I am X
  Failure is because I am not X or I am not X enough

Growth Mindset
  If I work at it, I can learn X
  Curious
Research Mindset for Research Life Events

I will
1. Counter my biases
2. Learn & innovate technically
3. Learn from failures & Learn emotional resilience

Have ideas
Work on ideas
Discuss ideas informally
Write up ideas
Submit/re-submit paper
Give talk / teach class
Receive verbal feedback
Receive formal evaluation
Exercise II
Review answers with partner. What was your mindset?

1. Permanence (time & space)
2. Personalization (you or not you)

   I. Your paper gets accepted
   II. Your paper gets rejected
Concluding Thoughts & Resources
Soha’s Mindset / Strategies

1. For bias
   - Slow down to understand gaps
   - Look at things from different angles

2. For research setbacks
   - Set it aside for a while
   - Process failures, don’t ignore them, and be kind to yourself

3. Emotional resilience
   - Understand what is important to me
   - Keep track of priorities and context
   - Surround yourself with great people

4. For creativity
   - Declutter. Clean slate.
   - Strive for 20% of time that is set for creative work on weekly basis: write, review, think.
Kathryn’s Mindset / Strategies

1. For bias
   • Look ahead of the bandwagon
   • Classic problems never go out of style, they just have new contexts

2. For research setbacks
   • Don’t wait for external feedback, self identify problems
   • Limit feeling sad to X days, then consciously channel sad to response
   • Synthesize feedback to adjust strategy
   • Strategize with collaborators, ask advice more broadly

3. For managing my emotions
   • Daily exercise, sleep, fruits & veggies, family time

4. For creativity
   • Create unscheduled work time
   • Read a lot and critically; what did they forget? logical next 4 steps/papers?
Acknowledgements
• Inspired by Professor Samuel Kounev’s course notes
• Professor Lori Pollock

Resources
• Carol Dwick, “Mindset: The New Psychology of Success”
• Martin Seligman, Learned Optimism, Questionnaire
• Daniel Kahneman, “Fast versus Slow Thinking”
• Implicit Bias Testing, https://implicit.harvard.edu/
• Olivia Goldhill, “The World is Relying on a Flawed Psychological test to Fight Racism”

Discussion & Questions
Pessimists

Believe bad events / misfortune
1. will last a long time
2. will undermine everything they do
3. are their own fault

Pessimistic explanatory style produces passiveness from believing action is futile
Optimists

Believe bad events / misfortune
1. is a temporary set back
2. is limited to this one event
3. is not my fault, other people, circumstances, bad luck

Optimistic explanatory style produces action, trying harder, particularly after a defeat or under pressure or given a challenge
Reflection & Discussion

Write down
1. Was overcoming bias a factor in your creativity?
2. Are other circumstances holding you back?
   For example, spending time doing what you know (homework) versus new skills (research, writing)
Homework II

pick a positive and negative event where your responses tend to pessimism and work to make them more optimistic

- Have ideas
- Work on ideas
- Discuss ideas informally
- Write up ideas
- Submit paper
- Give talk / teach class
- Receive verbal feedback
- Receive formal evaluation

good / bad
succeed / fail
well / poorly
accept / reject
well / poorly
positive / negative
positive / negative
Reflection

Write down

1. A recent creative idea
2. What were the circumstances (when, where, why, etc.)?
3. Circumstances under which you feel least creative
Reflection & Discussion

Write down

1. A recent *positive* event
2. Your feelings about what contributed most to that event
Write down

1. A recent *negative* event
2. Your feelings about what contributed most to that event
Reflect on

Your paper gets **accepted**

Your paper gets **rejected**

1. Permanence (time)
2. Pervasiveness (space)
3. Personalization (you or not you)
Easier to Innovate if:

1. You can identify the need for it
2. You ask WHY
3. You are good at asking WHY and answering
4. You love what you do

You can create happiness and impact where these 4 items meet — “Ikigai”
What is Your Ikigai?

Ikigai (ee-key-guy) is a Japanese concept that combines the terms *iki*, meaning “alive” or “life,” and *gai*, meaning “benefit” or “worth.”

When combined, these terms mean that which gives your life worth, meaning, or purpose.

Ikigai is similar to the French term “raison d’etre” or “reason for being.”
Delusions

- It is never your fault
- Optimism is always positive and desired in all situations
- Optimistic people face less failures overall in their work
- Optimism is a character trait and cannot be learned
- Success favors the most talented

Flexible optimism

- Success needs both optimism and occasionally some pessimism
- Success does not always favor the most talented, but rather the adequately talented that are also optimists!