

ASA ANNUAL CONFERENCE 2016 LAS VEGAS, NV

CRITICAL THINKING

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aerospace/aviation industry!*

*Providing Engineering, Quality System, Training,
Airworthiness, and Business Development
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G. Ringger Consulting, Inc.

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Workshop Chapters

Chapter 1: The 2 Types of Thinking

Chapter 2: The 3 Heuristics of thinking and how they impact decision-making.

Chapter 3: 10 Common Biases that interfere with Critical Thinking

Chapter 4: The 9 intellectual Standards

Chapter 5: The 8 elements of Critical Thinking

Chapter 6: Critical Thinking – Summing up!

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CHAPTER 1

The 2 Types of Thinking

2 Types of Thinking

System 1 (Top-Down)

- Refers to our intuitive reasoning;
- Typically fast, automatic, subconscious, effortless, and emotional;
- Used in most situations;
- Adequate for routine decisions and judgments.

System 2 (Bottom-Up)

- Refers to our deliberate reasoning;
- Is slower, conscious, effortful, explicit, and logical;
- Is the preferred method for important decisions and judgements.

System 1 (Top-Down) vs System 2 (Bottom-Up)

TOP-DOWN

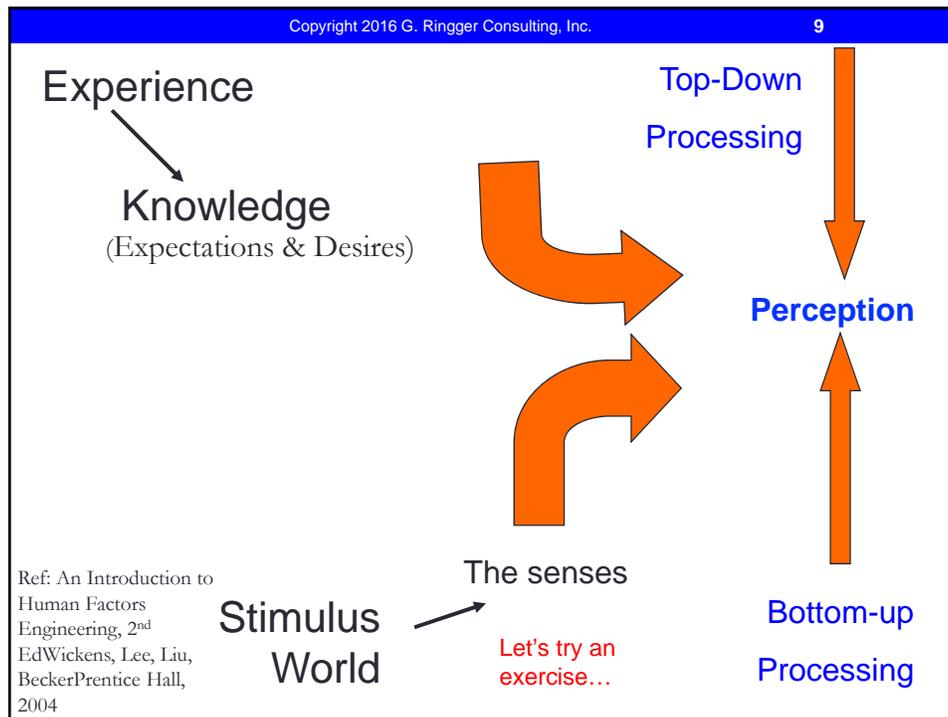
- Begins with a pre-existing knowledge of expectation (*schemata*)
- Leads you to search for information to satisfy pre-existing knowledge.

BOTTOM-UP

- Begins with isolated facts
- As isolated facts are gathered, they *eventually* describe a *schemata*.

Schemata: An understanding based on experience & knowledge

Ref: Computers, Graphics, & Learning, Copyright 2000 Lloyd P. Rieber, Chapter 4
Psychological Foundations of Instructional Graphics



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Exercise

As the following 8 numbers appear on the screen to the right,

add them *in you head* and jot down the sum.

What answer did you get?

1000
40
1000
30
1000
20
1000
<u>10</u>

Ref: Why do Busses come in Threes? The Hidden Mathematics of Everyday Life, Eastway, Wyndham Barnes & Nobel, Inc. John Wiley & Sons, Inc.1998

Exercise

Most adults make the same mistake.	1000
	40
After reaching 4,090 the brain anticipates the answer will be rounded up. It assumes from previous experience that the rounded number will be an easy one – 5,000.	1000
	30
	1000
	20
	1000
	<u>10</u>
	4,100



How does System 1 apply to aviation distributors?

- Skipping inspection steps because parts were purchased from OEM's or PAH's.
- "Reading in" contract requirements that simply just aren't there.
- Glancing through documents and drawing a premature conclusion.
- Assuming the part you're selling is an aircraft part.

Critical Thinking (System 2) – How do we define it?

It is the ability to apply knowledge and skills to achieve intended results.

Our ability to think clearly can be affected by:

- work environment;
- pressures;
- relationships and conflicts;
- attitudes and;
- commitment to apply the relevant knowledge and skills .

So, why is Critical Thinking Important?

Everyone thinks; it's what we do. But much of our thinking, if left to itself, is biased, distorted, partial, uninformed, or prejudiced.

When we think, we think for a ***purpose***, within a ***point of view***, based on ***assumptions***, that lead to ***implications*** and ***consequences***.

We use ***concepts***, ***ideas*** and ***theories*** to ***interpret*** data, facts, and experiences in order to ***answer*** questions, ***solve*** problems, and ***resolve*** issues.

If we want to think well, it's best we understand the underlying ingredients for critical thought.

Chapter 2

The 3 Heuristics of thinking and how they impact decision-making.

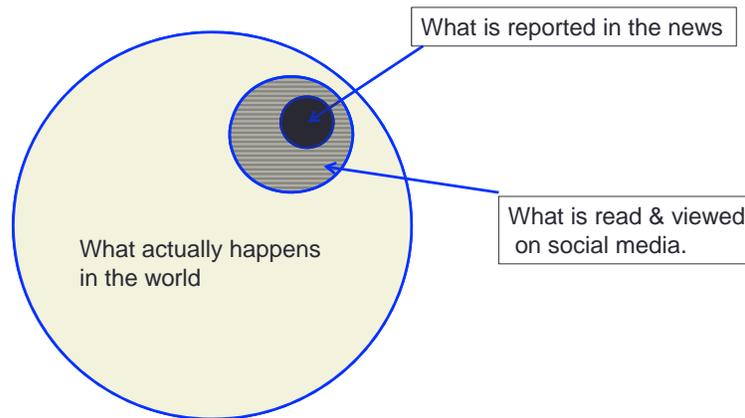
Heuristic # 1 - Availability Heuristic

People assess the frequency, probability, or likely causes of an event by the degree to which instances or occurrences of that event are readily “available” in memory.

An event that evokes emotions, is vivid, is easily imagined, and specific will be more available than an event that is unemotional in nature, bland, difficult to imagine, or vague.

Ref: (Tversky & Kaunemen, 1973); Bazerman & More, Judgement in Managerial Decision Making, 7th Ed., Carnegie Mellon University

Heuristic # 1 - Availability Heuristic



Heuristic # 2 - Representative Heuristic

“ When making a judgment about an individual (or object or event), people tend to look for traits an individual may have that correspond with previously formed stereotypes.”

Example:

The opinion from a doctor wearing a white coat is viewed as more credible than from a doctor wearing a T-shirt.

Ref: Bazerman & More, Judgement in Managerial Decision Making, 7th Ed., Carnegie Mellon University

Heuristic # 3 - Confirmation Heuristic

We search for and interpret evidence in a way that supports the conclusions we favored at the outset.

Ref: *(Nicklerson, 1998)*; Bazerman & More, *Judgement in Managerial Decision Making, 7th Ed.*,
Carnegie Mellon University

CHAPTER 3

10 Common Biases that interfere with Critical Thinking

10 Biases that interfere with Critical Thinking

1 Availability Heuristic	2 Representative Heuristic	3 Confirmation Heuristic
1. Ease of Recall	3. Insensitivity to base rates	7. Confirmation trap
2. Retrievability	4. Insensitivity to sample size	8. Anchoring
	5. Misconceptions of chance	9. Overconfidence
	6. Regression to the mean	10. Hindsight and the curse of knowledge

10 Biases that interfere with Critical Thinking

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1. Availability Heuristic – (1) Ease of Recall Bias

“Individuals judge events that are more easily recalled from memory, based on vividness or recency, to be more numerous than events of equal frequency whose instances are less easily recalled.”

Example:

A product manager will base their assessment of a new product roll-out based on the recent performance of a similar product roll-out.

Danger: Leads one’s judgment to more heavily weigh recent events and not on a full set of information.

1. Availability Heuristic – (2) Retrievability Bias

“Individuals are biased in their assessments of the frequency of events based on how their memory structures affect the search process.”

“We easily assume that our available recollections are truly representative of the larger pool of events that exists outside of our range of experience.”

Example:

Recently watched news video showing the long TSA security checkpoint lines at Chicago-Midway on a repeated do-loop.

Recollecting a personal experience of a long wait-time at Philadelphia Airport..

Drawing the wrong conclusion:

- (1) That all TSA checkpoints at all airports are ineffective in processing passengers.

10 Biases that interfere with Critical Thinking

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2. Representativeness Heuristic – (3) Insensitivity to base rates Bias

“When assessing the likelihood of events, individuals tend to ignore **base rates** if any other descriptive information is provided – even if irrelevant.”

Example:

Fact: The probability of an airline being involved in a fatal accident when flying on one of the top 39 commercial airlines is 1 : 19.8M flights.

Bias: “Yeah, but did you see what was reported last week?! The FAA budget wasn’t increased this year and there was an article in the Wall Street Journal about passenger baggage being lost or damaged! And those TSA lines! I’m telling ya! They’re dropping the ball. Flying just isn’t as safe as it used to be!”

Danger: Drawing the wrong conclusion based on false inputs.

Source: OAG Aviation & PlaneCrashInfo.com accident database, 20 years of data (1993 - 2012)
<http://www.wsj.com/articles/baggage-claim-airlines-are-winning-the-war-on-lost-luggage-1401922595>
 Wall Street Journal, By Scott McCartney, June 4, 2014 6:57 p.m. ET

2. Representativeness Heuristic – (4) Insensitivity to sample size bias

“When assessing the reliability of sample information, individuals frequently fail to appreciate the role of sample size.”

Consider these facts when flipping a fair coin:

- 3 flips will produce > 60% heads, half the time.
- 10 flips will produce > 60% heads, only 17% of the time.
- 3,000 flips will produce > 60% heads, 0.000001% of the time.

Example: “4 out of 5 dentists claim ...”

If only 5 dentists were surveyed, do 5 dentists represent the entire population of doctors?

Danger: Without knowing the sample size, any claim is meaningless.

2. Representativeness Heuristic – (5) Misconceptions of chance

Select the random sequence:

(a) H-H-H-T-T-T or (b) H-T-H-T-T-H

“Individuals expect that a sequence of data generated by a random process will “**look random**,” even when the sequence is too short for those expectations to be statistically valid.”

Bias: Chance is commonly viewed as a self-correcting process in which a deviation in one direction will induce a deviation in the opposite direction so as to restore balance. *(Las Vegas loves this!!!)*

Participants routinely selected (b) over (a) because (b) “looked more random”, even though both represent an equal likelihood of heads and tails. *(Kahneman and Tversky, 1972)*

Danger: Inappropriately triggers our tendency to assume that random and nonrandom events will balance out. Past results might not dictate future results.

Ref: Bazerman & More, Judgement in Managerial Decision Making, 7th Ed., Carnegie Mellon University

2. Representativeness Heuristic – (6) Regression to the mean

“Individuals tend to ignore the fact that extreme events tend to regress to the mean on subsequent trials.”

3 Examples...

Example-1 - Flight Training (*Kahneman and Tversky, 1973*):

Which is better: praise or criticism?

Praise given for a smooth landing was generally followed by a rougher landing on the next try, while criticism of a harsh landing was generally followed by a smoother landing on the next try.

The instructors wrongly concluded that verbal rewards were detrimental to learning, while verbal punishment was beneficial.

2. Representativeness Heuristic – (6) Regression to the mean

“Individuals tend to ignore the fact that extreme events tend to regress to the mean on subsequent trials.”

Example 2 - Business: “We had a record-breaking 1st Quarter last year, so there’s no reason we can’t match that again this year!”

Example 3– Performance Evaluations: “Joe, you had two outstanding sales months. We even gave you a preferred parking space! But this month your sales are down. Nothing has changed on our end, so you better shape up!”

Danger: Not recognizing that processes &/or circumstances must change in order to impact results, otherwise events will tend to regress to the mean.”

10 Biases that interfere with Critical Thinking

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3. Confirmation Heuristic – (7) Confirmation trap

“Individuals tend to seek confirmatory information for what they think is true and fail to search for disconfirmatory evidence.”

When we encounter information that is consistent with our beliefs we openly accept it. However, when we discover information that contradicts our beliefs, we ask ourselves, “*Must I believe it or can I dismiss it?*”

Example:

Getting our news from TV magazine shows who portray themselves to be NEWS outlets. e.g., CNN; CNN; FOX; MSNBC

3. Confirmation Heuristic – (8) Anchoring

“Individuals make estimates for values based upon an initial value derived from past events, random assignment, or whatever information is available, and typically make insufficient adjustments from that **anchor** when establishing a final value.”

Example 1: Basing today’s quote on past sales rather than market conditions.

Example 2, China Air Flt 006: Basing all decisions on the premise the air-speed indicator was faulty.

Example 3 – Business negotiation: Setting an arbitrary starting point (price, condition, etc).

Example 4 - 1st Impression Anchor: Real estate / automobile purchase;, the 1st one viewed becomes the “standard” by which all others are judged. Car dealers always show you the most expensive car first.

Danger: Skews our perspective by establishing “false” baselines for decisions.

3. Confirmation Heuristic – (9) Overconfidence bias

“Individuals tend to be overconfident of the infallibility of their judgments when answering moderately to extremely difficult questions.”

Example: You have developed a marketing plan for a new product. You are so confident in your plan that you have not developed any contingencies for early market failure. When the 1st stage of our plan falters, will you change/adjust your strategy or “stay the course”?

Danger: Becoming blind to actual risks. Being susceptible to “sunk-cost” dogma (it’s too late to turn back.)

3. Conformation Heuristic – (10) Hindsight

“After finding out whether or not an event occurred, individuals tend to overestimate the degree to which they would have predicted the correct outcome.

Classic “Monday-morning Quarterbacking”

Example: “Well, I could have told you that!”

Example – Political: “How could they not have foreseen the rise of ISIS with the overthrow Iraq and Libya!”

Danger: Feeds overconfidence in your perception and ability to anticipate results.

3. Confirmation Heuristic – (10) The “Curse of knowledge” bias

“Individuals fail to ignore information they possess that others do not, when predicting other’s behavior.”

Example -

Turn left, then go
down the street.
You can’t miss it!
It’s the brick house
on the right.



10 Biases that interfere with Critical Thinking

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CHAPTER 4

The 9 intellectual Standards

Critical Thinking is founded on...

9 intellectual standards and;

These 9 intellectual Standards are the foundation by which all critical thinking should be measured.

These 8 structural elements are available in all thinking.

The 9 intellectual Standards

9 Intellectual Standards

1. Clarity
2. Accuracy
3. Precision
4. Relevance
5. Depth
6. Breadth
7. Logic
8. Significance
9. Fairness

Others, as well....

- *Completeness*
- *Validity*
- *Rationality*
- *Sufficiency*
- *Necessity*
- *Feasibility*
- *Consistency*
- *Authenticity*
- *Effectiveness*
- *Efficiency*

1. Clarity

Is it understandable?

- Can you elaborate further?
- Can you provide an example?
- Can you illustrate what you mean?

Example:

“We need to increase our customer base.”

2. Accuracy

- Is it true?
- Its is free from inaccuracies?
- Does it distort the topic?
- How can we verify the statement is true?
- Can we test the accuracy?

Example: “Our customers are dissatisfied. We need to increase our customer base.”

3. Precision

- Is it described in sufficient detail?
- Are more details available?
- Are values too general for the statement?

Example:

“Our June RMAs doubled from last month! We’re out of control!”

Actual April data: 4 RMAs issued out of 200 shipments.

Actual June data: 8 RMAs issued out of 400 shipments.

4. Relevance

- Does it relate or pertain to the matter (issue) at hand?
- How does it relate to the topic or question?
- How does it bear on the topic? (*interesting by, so what?*)
- How does it help with the matter (issue) at hand?

Example: *“Last Quarter we opened two forward stocking locations; one in the UK and the other in Hong Kong. Our Los Angeles office is reporting higher employee turnover than our New York office. Get HR from New York out to LA. We need this addressed.”*

5. Depth

- Does it contain inner-complexities?
- Does it contain multiple interrelationships?
- Can inner-complexities or multiple interrelationships be parsed out?

Example: *“Our on-time delivery performance is well above our 98% OTD goal. So, why do we keep getting RMA requests for late deliveries?”*

6. Breadth

- Are there embedded multiple viewpoints?
- Should this be looked at from other perspectives?

Example: *“Sales keeps telling me this is a great opportunity, but finance tells me to “put on the brakes!”*

- Why should we proceed?”
- Why should we not proceed?
- What are the risks?
- Do we have sufficient information to make a decision?
- What are the benefits versus the costs?

7. Logic

Example:

A baseball and a bat cost \$1.10 in total. The bat costs \$1 more than the ball. How much does the ball cost?

Quick! Answer! _____ .

You probably said \$0.10 cents. The correct answer is \$0.05.

Psychologist Daniel Kahneman says more than half of students at Harvard and MIT can't answer the bat-and-ball question correctly.

- Are there internal contradictions within the statement?
- Does it make sense?
- Does the evidence presented support the statement?

8. Significance

- Does it focus on what is important or vital?
- Is it the central idea to focus on?
- Is the evidence presented ranked or identified by importance to the matter at hand?

Example:

Important

Do it

Decide
Strategically

Not
important

Delegate it

Delete it

Urgent

Not Urgent

9. Fairness

- Is it justified or self-serving?
- Is it one-sided?
- Is it biased or prejudiced to a particular POV?

Example: Actually happened at a \$1B aviation corporation:

A corporate-wide sales campaign was launched to drive up profits:

- Only quote parts with > 50% profit margins.
- Incentivize entire sales staff with bonuses tied to PN volume sold (part qty, not part \$).

Objective: Drive up volume and sales!

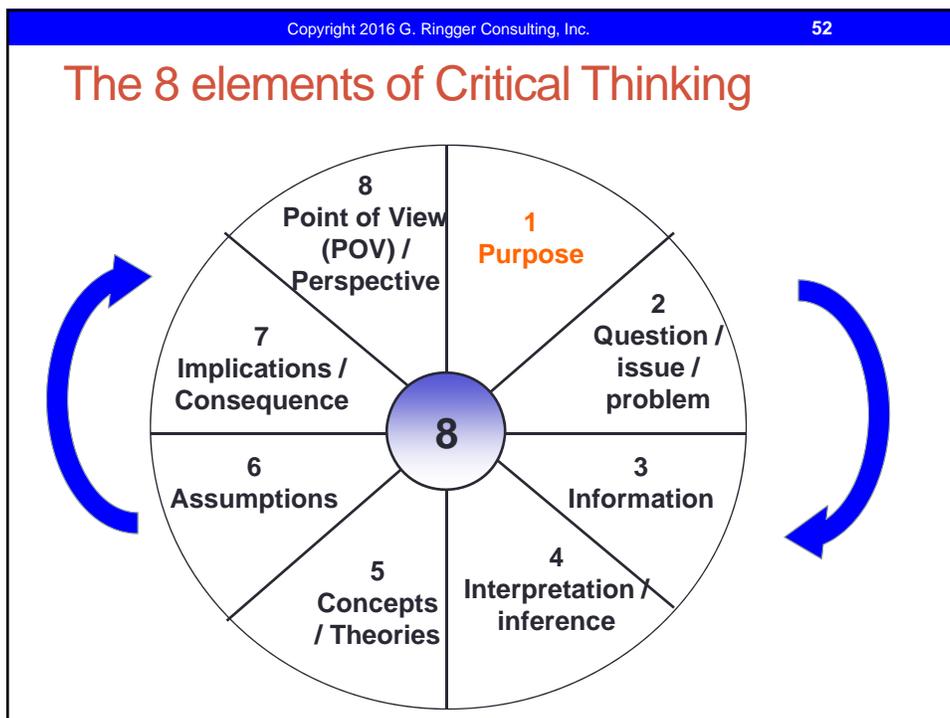
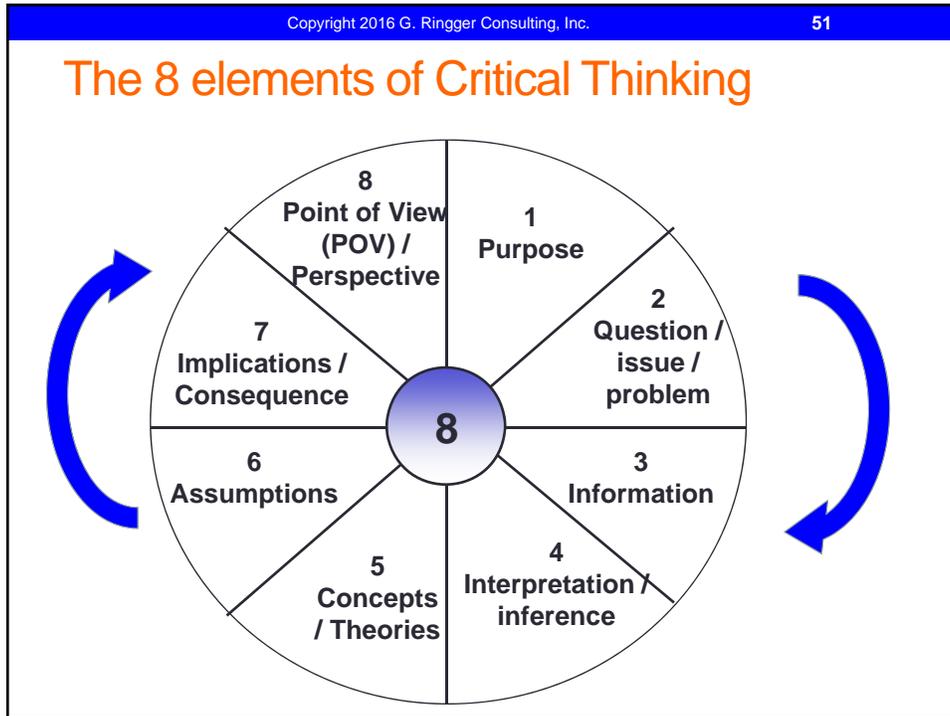
Consequence: High value/lower margin sales plummeted.
(e.g. engines, landing gear)

Low value/high margin (hardware) sales skyrocketed.

Result: Overwhelmed production capacity, cash-flow evaporated, company stock tanked. The company was purchased and dismantled.
(1,200 lost their jobs!)

CHAPTER 5

The 8 elements of Critical Thinking



1: Purpose

All reasoning has a **PURPOSE**.

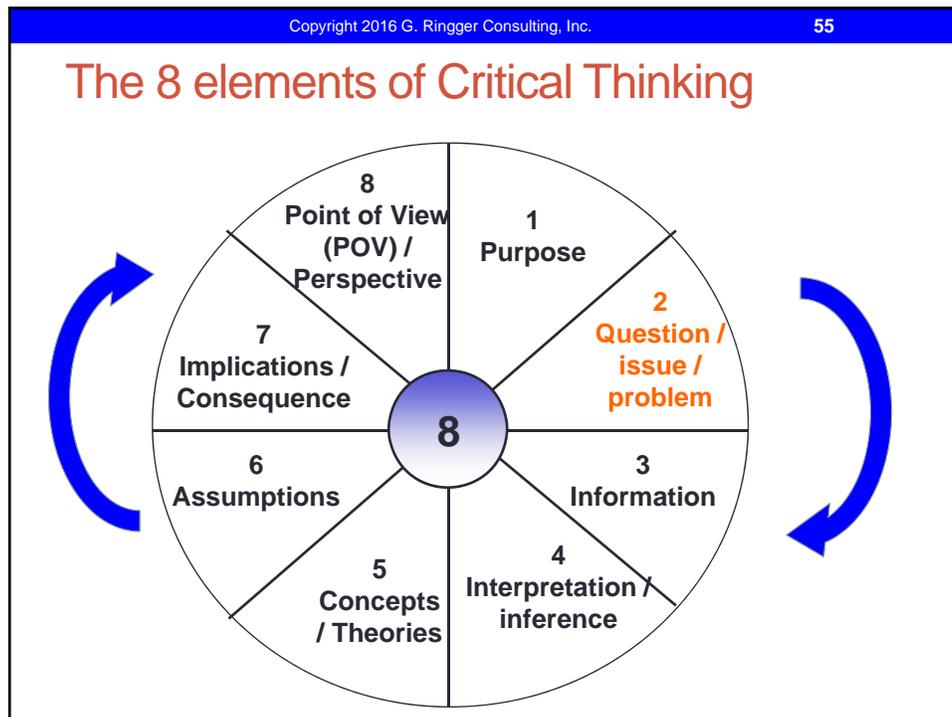
- Take time to state your purpose clearly.
- Distinguish your purpose from related purposes.
- Check to be sure you are on target.
- Choose a significant and a realistic purposes.

Example:

“Can someone tell me again, why are we doing this!?”

1. Purpose

- Your purpose is your goal, your objective.
- It is what you are trying to accomplish.
- It represents your motives; your intentions
- Your purpose should be justifiable.
- **Questions that target the purpose:**
 - What is your purpose in doing...such and such?
 - What is the objective of this assignment ?
 - Should we challenge/modify our purpose/goal/objective?
 - What is the purpose of this meeting?
 - What is our central aim in this line of thought?
 - Why did you say...such and such?



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2: Question / issue / problem

All thinking is an attempt to figure something out; to settle some question; to solve some problem.

- State the question clearly and precisely.
- Express the question in several ways to clarify its meaning.
- Break the question into sub-questions.
- Distinguish questions that have definitive answers from those that are *opinion* or require *multiple viewpoints*.

2. Question / issue / problem

State the Question

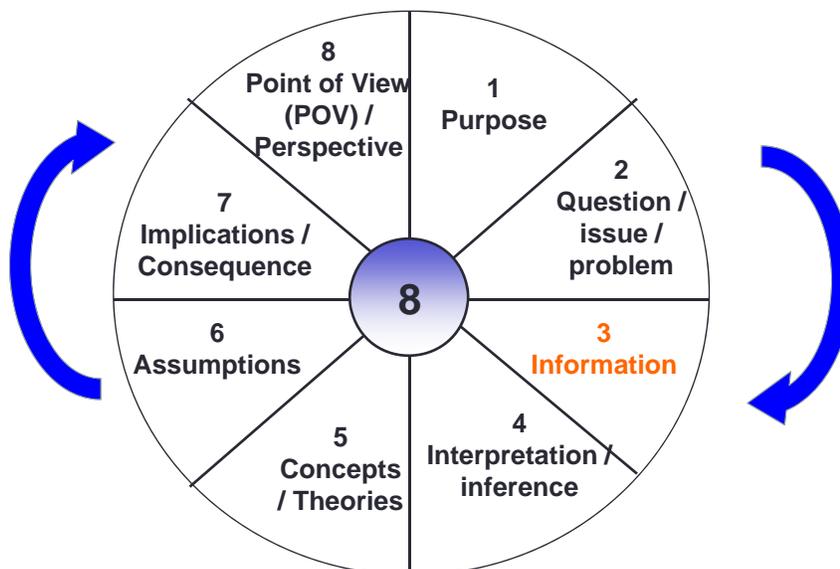
The question lays out the problem or issue and guides your thinking.

When the question is vague, our thinking will lack clarity and distinctness.

The question should be clear enough to productively guide our thinking.

- | | |
|--|--|
| <ul style="list-style-type: none"> • What is the question I am trying to answer? • What important questions are embedded in the issue? • Is there a better way to state the question? • Is this question clear? • Is this question complex? | <ul style="list-style-type: none"> • I am not sure exactly what question you are asking. Could you explain it? • The question in my mind is this: • How do <u>you</u> see the question? • What kind of question is this; historical, scientific, ethical, political, economic or...? |
|--|--|

The 8 elements of Critical Thinking



3: Information

All thinking is based on data, information and evidence.

- Identify and limit any claims to only those supported by the data.
- Search for information that *opposes* your position as well as information that supports it.
- Make sure all information used is clear, accurate and *relevant*.
- Make sure you have gathered sufficient information.

3: Information

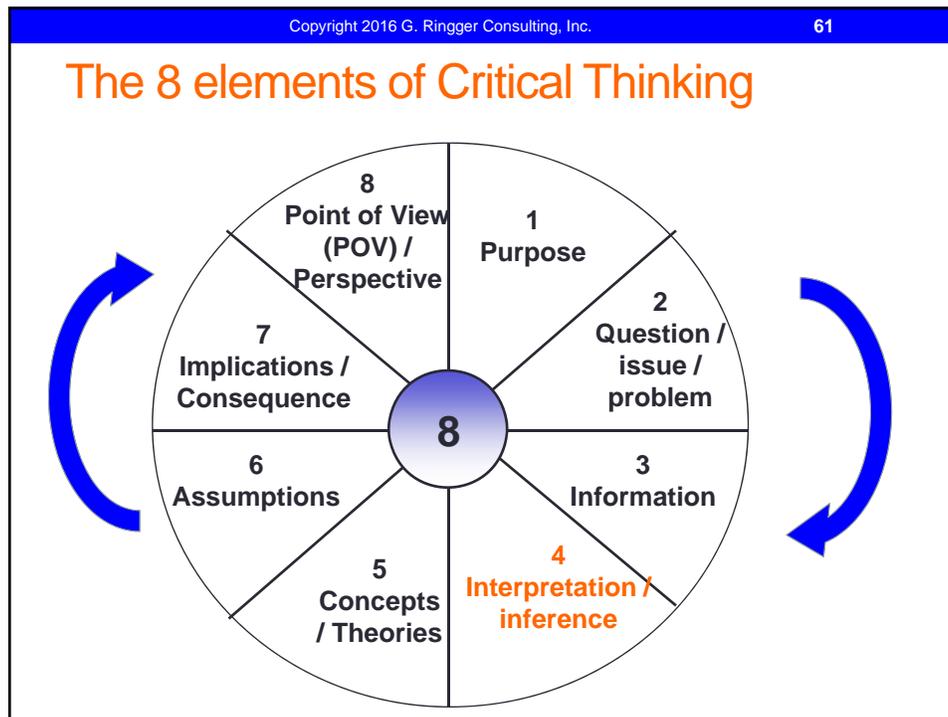
Gather... Information

Information includes the facts, data, evidence, or experiences used to figure things out.

Information does not necessarily imply it's accurate, correct or relevant to the question or issue you are addressing.

Questions that target information:

- | | |
|---|---|
| <ul style="list-style-type: none"> • What information do I need to answer this question? • What data are relevant to this problem? • Is more information needed? • Is this information relevant to our purpose or goal? | <ul style="list-style-type: none"> • On what information are you basing that comment? • What experience convinced you of this? • Could your experience be distorted? • How do we know this information is accurate? • Have we left out any important information that we need to consider? |
|---|---|



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4: Interpretation / inference

- All thinking contains *inferences* or *interpretations* from which we draw *conclusions* and give meaning to data.
- Therefore, *infer* only what the evidence implies.
- Inferences are not observations.
- Check inferences for their consistency with each other.
- Identify assumptions underlying your inferences.

Example: When the meeting with his supervisor was over, he was so anxious to leave that he left his ipad behind.

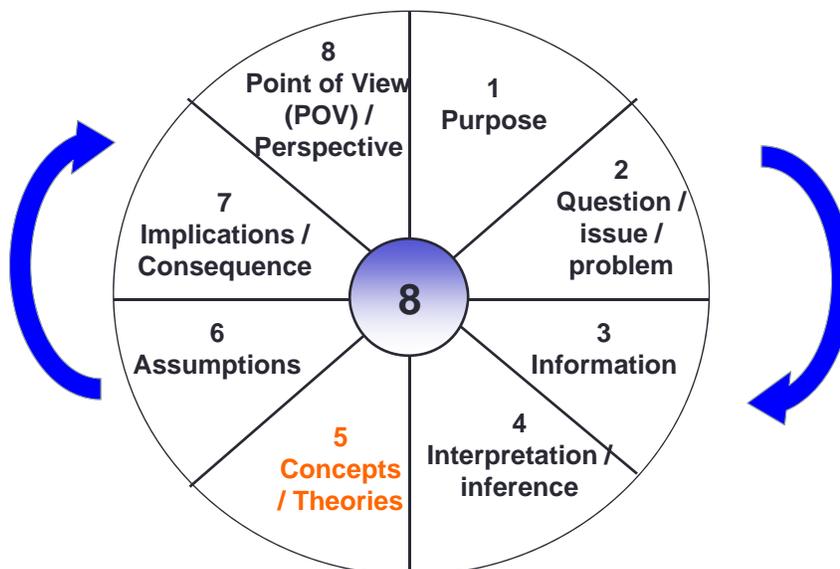
They left in a hurry right after our offer! They must be anxious to make the deal!

4: Interpretation / inference

Interpretations & Inferences are conclusions we draw.
***Inferring* is what the mind does in figuring something out.**
***Inferences* should logically follow from the *evidence*.**
***Infer* no more or less than what is *interpreted* in the situation.**
Questions to check your inferences:

- | | |
|--|--|
| <ul style="list-style-type: none"> • What conclusions am I coming to? • Is my inference logical? • Are there other conclusions I could draw? • Does this interpretation make sense? • Does our solution follow from our data? | <ul style="list-style-type: none"> • How did you reach that conclusion? • What are you basing your reasoning on? • Is there an alternative plausible conclusion? • Given all the facts what is the best possible conclusion? • How shall we interpret these data? |
|--|--|

The 8 elements of Critical Thinking



5: Concepts / Theories

Thinking is expressed and shaped by **concepts**.

Concepts are ideas, theories, laws, principles, or hypotheses we use in thinking to make sense of things.

- Key concepts need to be identified and explained clearly.
- Consider alternative concepts or alternative definitions of concepts.
- Make sure you are using concepts with precision.

Example - Quote: *“I have made this letter longer than usual, because I lacked the time to make it short.”* —Blaise Pascal

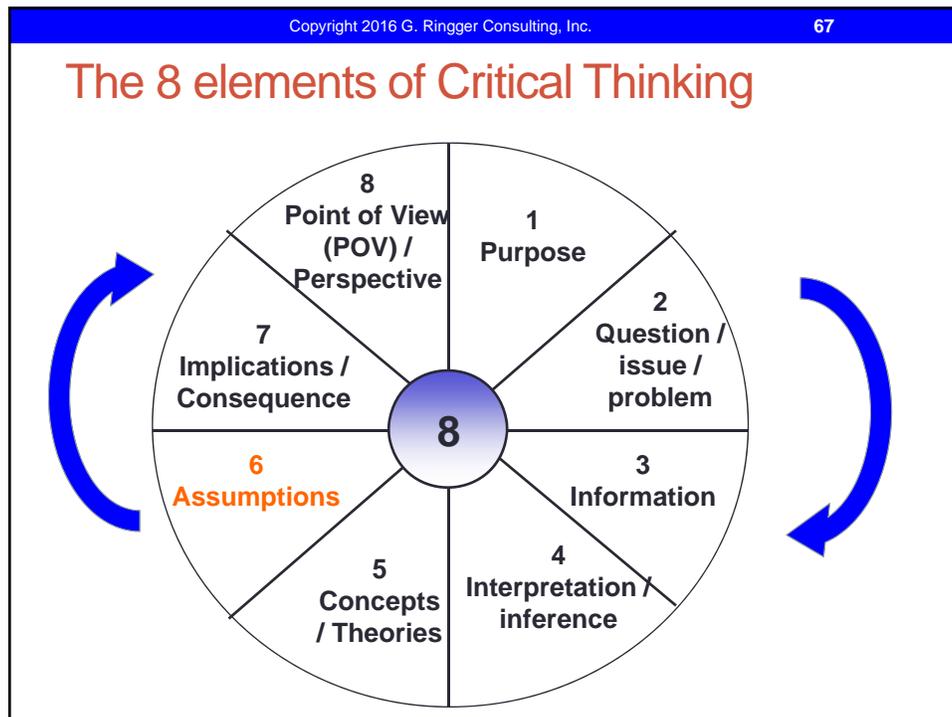
5: Concepts / Theories

Clarify Your... Concepts

Be clear about the concepts you are using.

Questions you can ask about concepts:

- | | |
|---|--|
| <ul style="list-style-type: none"> • What idea am I using in my thinking? • Is this idea causing problems for me or for others? • I think this is a good theory, but can it be explained more fully? | <ul style="list-style-type: none"> • What is the main hypothesis we are using in our reasoning? • What main distinctions should we draw in reasoning through this problem? • What idea is this proposal based on? |
|---|--|



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6: Assumptions

Assumptions are beliefs you take for granted. They can operate at both the subconscious or unconscious level of thought.

They frame the boundaries of the thought.

Example :

A: "I thought they were going to provide the full engine records back-to-birth."

B: "There was nothing in the contact requiring this."

A: "I thought that was a given! Now, what do we do!?"

6: Assumptions

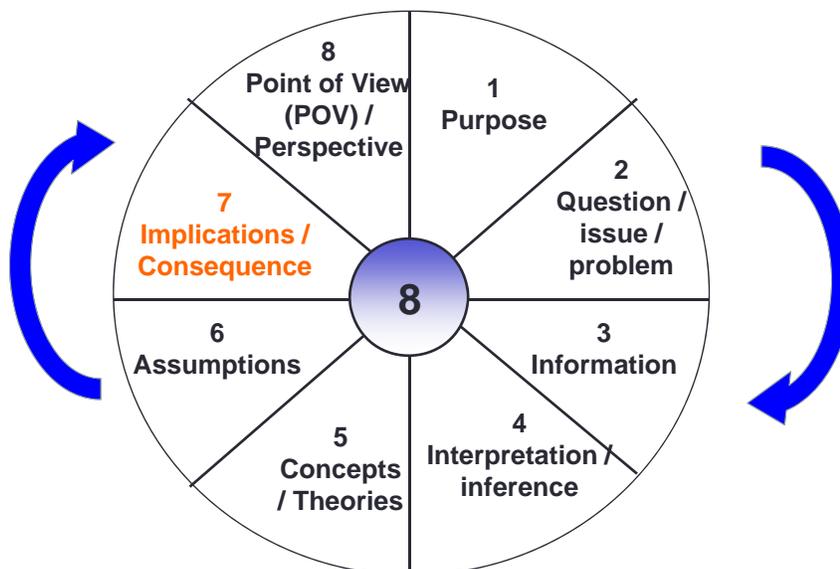
All assumptions should be:

- clearly identified and
- determined to be both relevant and justifiable.

Questions you can ask about assumptions:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Consider how your assumptions shape your point of view. • What am I assuming or taking for granted? • Am I assuming something I shouldn't? | <ul style="list-style-type: none"> • What assumption is leading me to this conclusion? • What is... (this policy, strategy, explanation) assuming? • What is being presupposed in this proposal / theory? |
|--|--|

The 8 elements of Critical Thinking



7: Implications / Consequences

Thinking leads to “somewhere”.

That “somewhere” has *implications* and *consequences*.

Implications are *claims* or *truths* that logically follow from other claims or truths. *Implications* follow from *thoughts*. They are inherent in your thoughts, whether you see them or not.

Implications lead to *consequences* and *consequences* follow from *actions*.

Claims/truths → implications → actions → consequences

7: Implications / Consequences

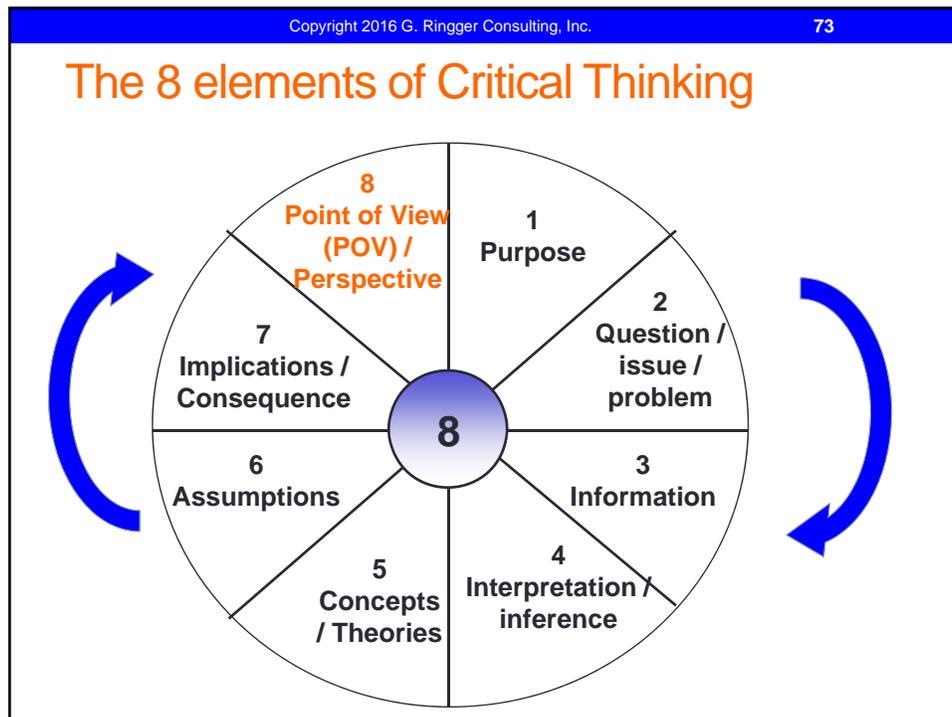
Implications and Consequences:

Claims or truths that logically follow from other claims or truths. Implications follow from thoughts. Consequences follow from actions.

Implications are inherent in your thoughts, whether you see them or not. The best thinkers think through the logical implications in a situation before acting.

Questions you can ask about implications:

- | | |
|--|---|
| <ul style="list-style-type: none"> • If I decide to do “X”, what things might happen? • If I decide <u>not</u> to do “X”, what things might happen? • What are you implying when you say that? • What is likely to happen if we do this versus that? | <ul style="list-style-type: none"> • How significant are the implications of this decision? • Will these implications lead to consequences we have not anticipated? |
|--|---|



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8: Point of View (POV) / Perspective

Thinking is done from some *point of view* (perspective).

- Identify your point of view
- Seek other points of view and identify their *strengths* as well as *weaknesses*.
- Strive to be fair-minded in evaluating all points of view.

Example:

From the Sales' POV the contract will yield revenue that meets our Quarterly projections.

However, from the shareholders' POV, the contract terms will not bring the cash flow desired.

8: Point of View (POV) / Perspective

Point of View: is the perspective from which you and others view something.

Make sure you understand the limitations of your POV and that you fully consider other relevant perspectives.

Questions to check your point of view:

- | | |
|--|--|
| <ul style="list-style-type: none"> • How am I looking at this situation? • Is there another way to look at it that I should consider? • What exactly am I focused on? And how am I seeing it? How are others seeing it? • Is my POV the only reasonable view? • From this POV, what am I missing or ignoring? | <ul style="list-style-type: none"> • Have you ever considered the way others view this? • Which of these perspectives makes the most sense given the situation? • Am I having difficulty looking at this situation from this perspective? • From my perspective does this decision challenge my personal beliefs ethics or morals? |
|--|--|

CHAPTER 6

Critical Thinking – Summing up!

2 Types of Thinking

System 1 (Top-Down)

- Refers to our intuitive reasoning.
- Typically fast, automatic, subconscious, effortless, and emotional.
- Most decisions in life
- In most situations, quite adequate for routine decisions and judgments.

System 2 (Bottom-Up)

- Refers to our deliberate reasoning.
- Is slower, conscious, effortful, explicit, and logical.
- Is the preferred method for important decisions and judgements.

The 3 Heuristics of thinking and how they impact decision-making.

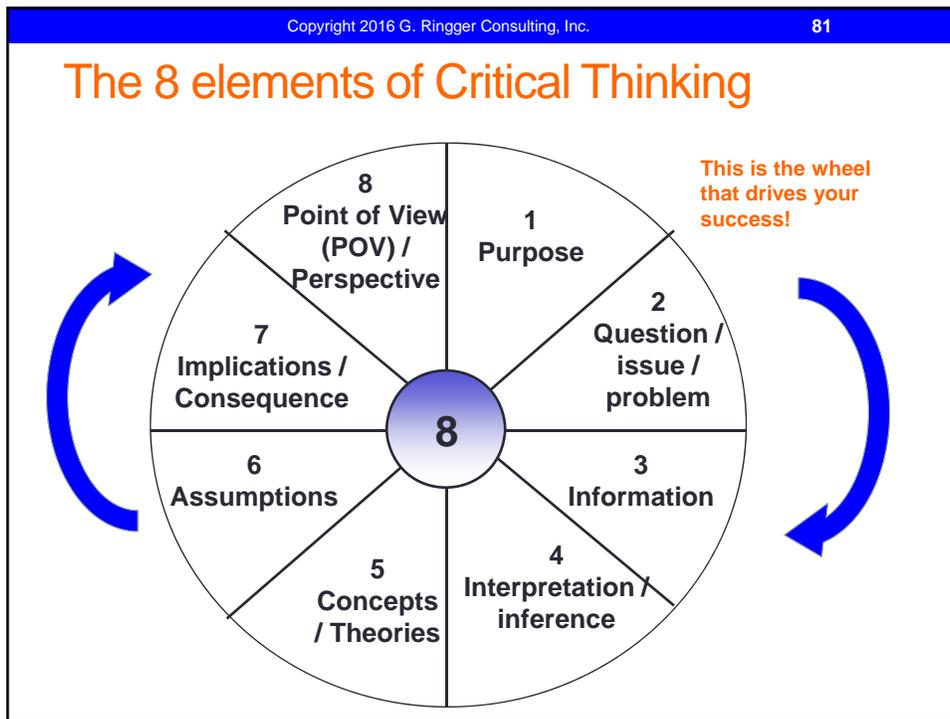
1. Availability Heuristic
2. Representative Heuristic
3. Confirmation Heuristic

10 Biases that interfere with Critical Thinking

1 Availability Heuristic	2 Representative Heuristic	3 Confirmation Heuristic
1. Ease of Recall	3. Insensitivity to base rates	7. Confirmation trap
2. Retrievability	4. Insensitivity to sample size	8. Anchoring
	5. Misconceptions of chance	9. Overconfidence
	6. Regression to the mean	10. Hindsight and the "curse of knowledge"

The 9 Intellectual Standards

1. Clarity
 2. Accuracy
 3. Precision
 4. Relevance
 5. Depth
 6. Breadth
 7. Logic
 8. Significance
 9. Fairness



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CRITICAL THINKING

QUESTIONS?

Thanks for attending!

and remember...

“To stop learning.... is to stop living.”

George J. Ringger

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