GWBAA

Presentation

BIAS IN DECISION MAKING

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May 5, 2016

Icarus

What can the Ancient Greeks of 3000 years ago teach modern aviators?

Why should we even listen?

What “Daedalus” did not take into account

Human Nature

- Individual Personality
- Personal Behavior
- Bias Effect or Perception

There are at least 171 known cognitive biases.

Dr. Kathleen Sutcliffe – Ross School of Business, University of Michigan

A Truism

- No one thing “causes” accidents
- Confluence of multiple events, task demands, actions taken or not taken, and environmental factors

NASA Ames Research Center, 2006

Two Fallacies About Human Error

Myth: Experts who make errors performing a familiar task reveal lack of skill, vigilance, or conscientiousness.

Fact: Skill, vigilance, and conscientiousness are essential, but not sufficient to prevent error.

NASA Ames Research Center, 2006

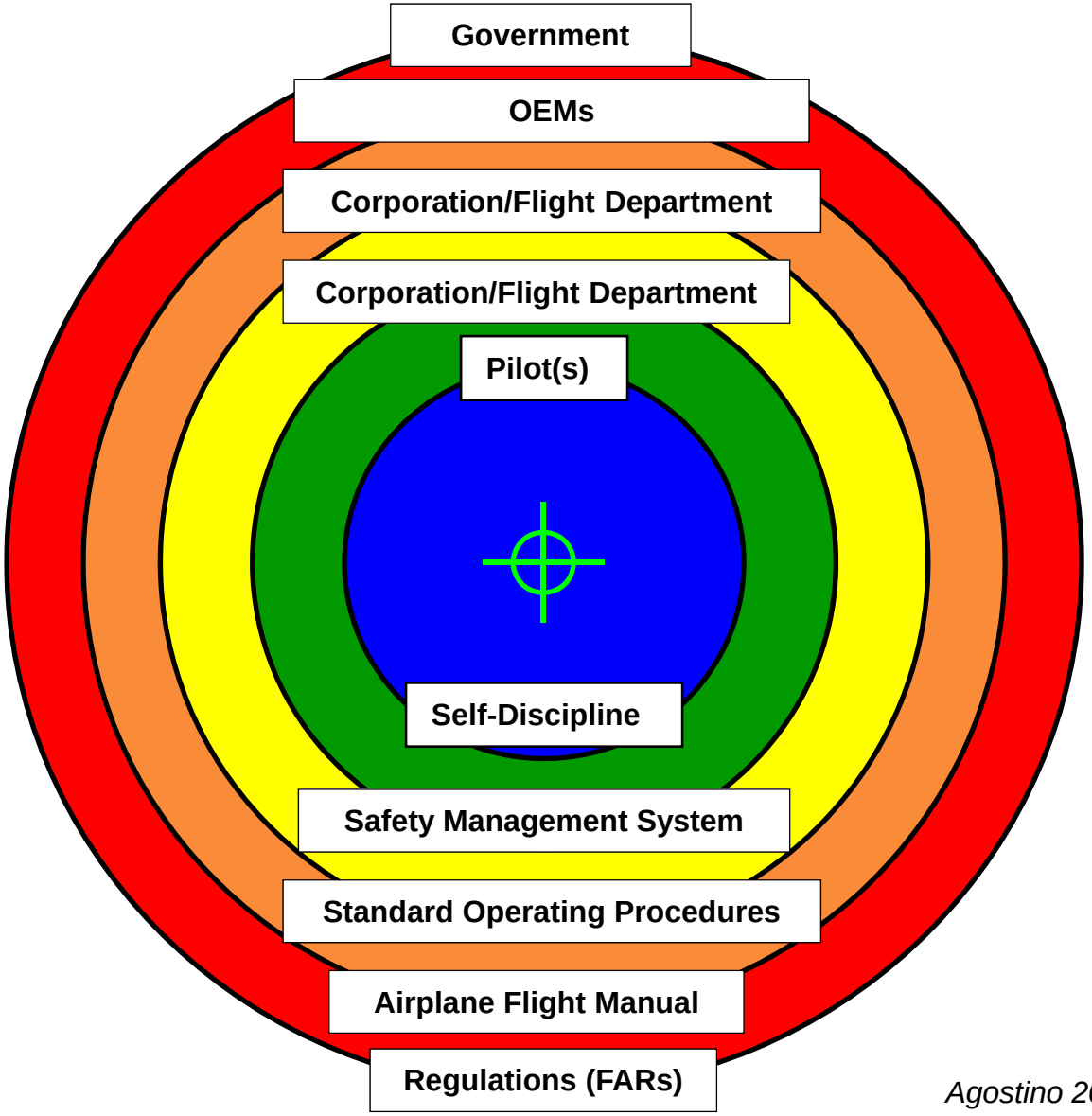
Two Fallacies About Human Error (con't)

Myth: If experts can normally perform a task without difficulty, they should always be able to perform that task correctly.

Fact: Experts periodically make errors as consequence of subtle variations in task demands, information available, and cognitive processing.

NASA Ames Research Center, 2006

Safety Protection Model



Agostino 2004

… I Don’t believe in Safety

… I Don't believe in Safety
I believe in Competence…

(Scott Crossfield, 2004)

Six Overlapping Clusters of Error Situations

1) Inadvertent slips and oversights while performing highly practiced tasks under normal conditions

2) Inadvertent slips and oversights while performing highly practiced tasks under challenging conditions

3) Inadequate execution of non-normal procedures under challenging conditions

4) Inadequate response to rare situations for which pilots are not trained

5) Judgment in ambiguous situations

6) Deviation from explicit guidance or SOP

NASA Ames Research Center, 2006

“To operate an Air Machine requires both Knowledge & Skill”

Wilber Wright
Paris 1905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Express
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It is impossible for a man to learn what he thinks he already knows…

--Epictetus

Confirmation Bias

Confirmation Bias is perhaps the best known & most widely accepted notion of inferential error to come out of the literature on human reasoning.

(Evans, 1989)

- **Confirmation Bias** will cause us to view or process data in ways which tend to confirm our idea or observations.
- And at the same time, reject or devalue information, facts, or opinions that are in opposition to our hypothesis or stated position.

Bias Factors:

Most likely reason we fall into the confirmation bias trap, it is easier to deal with on a cognitive basis.

(Gilovich 1993)

Bias Factors

- The effects become stronger the more emotionally charged the issue.
- People often show confirmation bias because they are weighing up the cost of being wrong. (Narcissism, Egocentric Personality)
- Personality traits influence and interact with bias process.
- People with high levels of confidence more readily seek out contrary points of view.

Consequences of Confirmation Bias

- Effects information processing.
- Poor or fatal decisions will occur because we ignore or undervalue evidence that is contrary to our opinions.

NORMALITY BIAS

Any resemblance to the previous slide is purely coincidental

NORMALITY BIAS:

The **normality bias**, is a mental state people enter when facing a disaster. It causes people to underestimate both the possibility of a disaster and its possible effects. This may result in situations where people fail to adequately prepare for a disaster.

- Normality bias can result in the inability of people to cope with a disaster once it occurs. People with a normality bias have difficulties reacting to something they have not experienced before. People also tend to interpret warnings in the most optimistic way possible, seizing on any ambiguities to infer a less serious situation.

- Normality bias may be caused in part by the way the brain processes new data. Research suggests that even when the brain is calm, it takes 8-10 seconds to process new information. Stress slows the process, and when the brain cannot find an acceptable response to a situation, it fixates on a single and sometimes default solution that may or may not be correct.

Effects

- Normality bias often results in unnecessary injuries or death in disastrous situations.
- Normality bias can cause people to drastically underestimate the effects of a potential disaster.

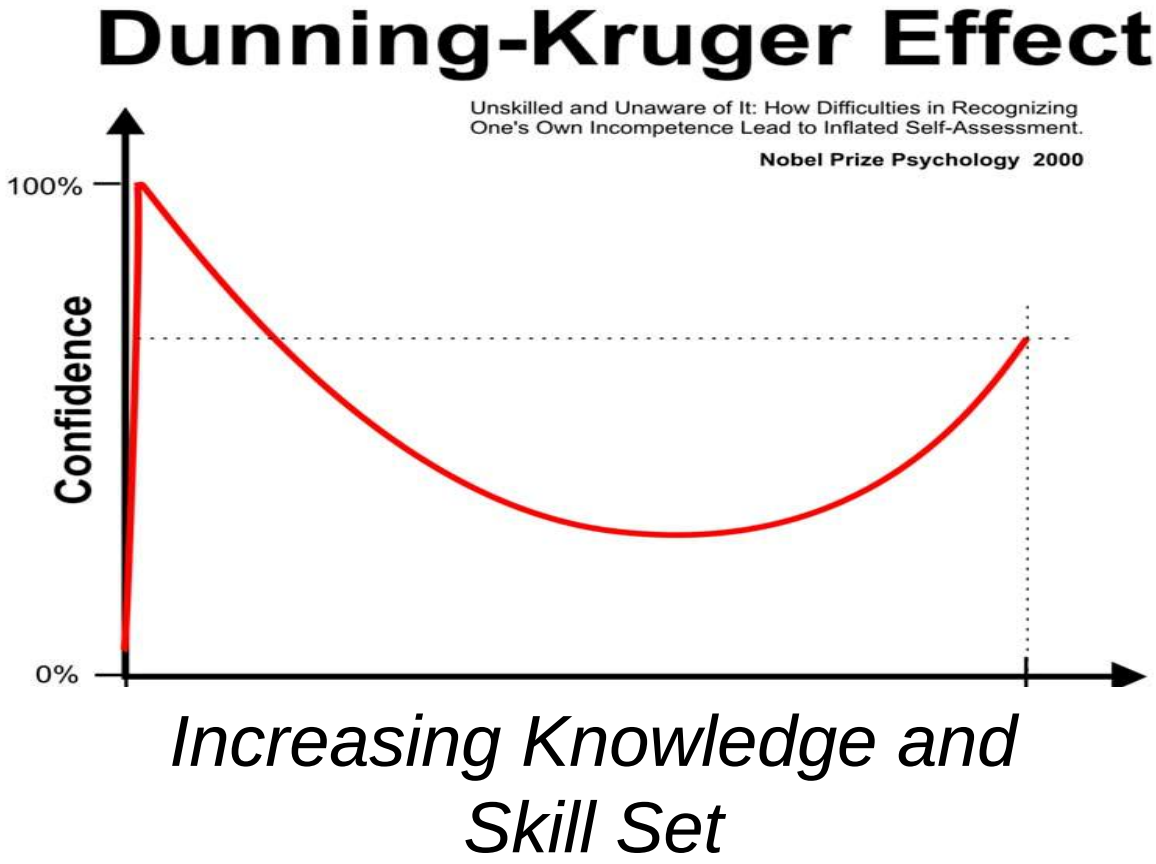
Prevention

- The negative effects can be combated through the 4 stages of disaster response:
  1. *Preparation*, including publicly acknowledging the possibility of disaster and forming contingency plans.
  2. *Warning*, issue clear unambiguous direction and properly prioritize warnings.
  3. *Define*, the stage at which the contingency plans take effect.
  4. *Aftermath*, reestablishing equilibrium after the emergency/abnormal event.

Critical Thinking

Critical thinking is that mode of thinking — about any subject, content, or problem — in which the thinker improves the quality of his or her thinking by skillfully analyzing, assessing, and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem-solving abilities, as well as a commitment to overcome our native egocentrism and sociocentrism.

A very common cognitive bias where lesser skilled individuals suffer from illusion of superiority, mistakenly assessing their ability to be much higher than is accurate.



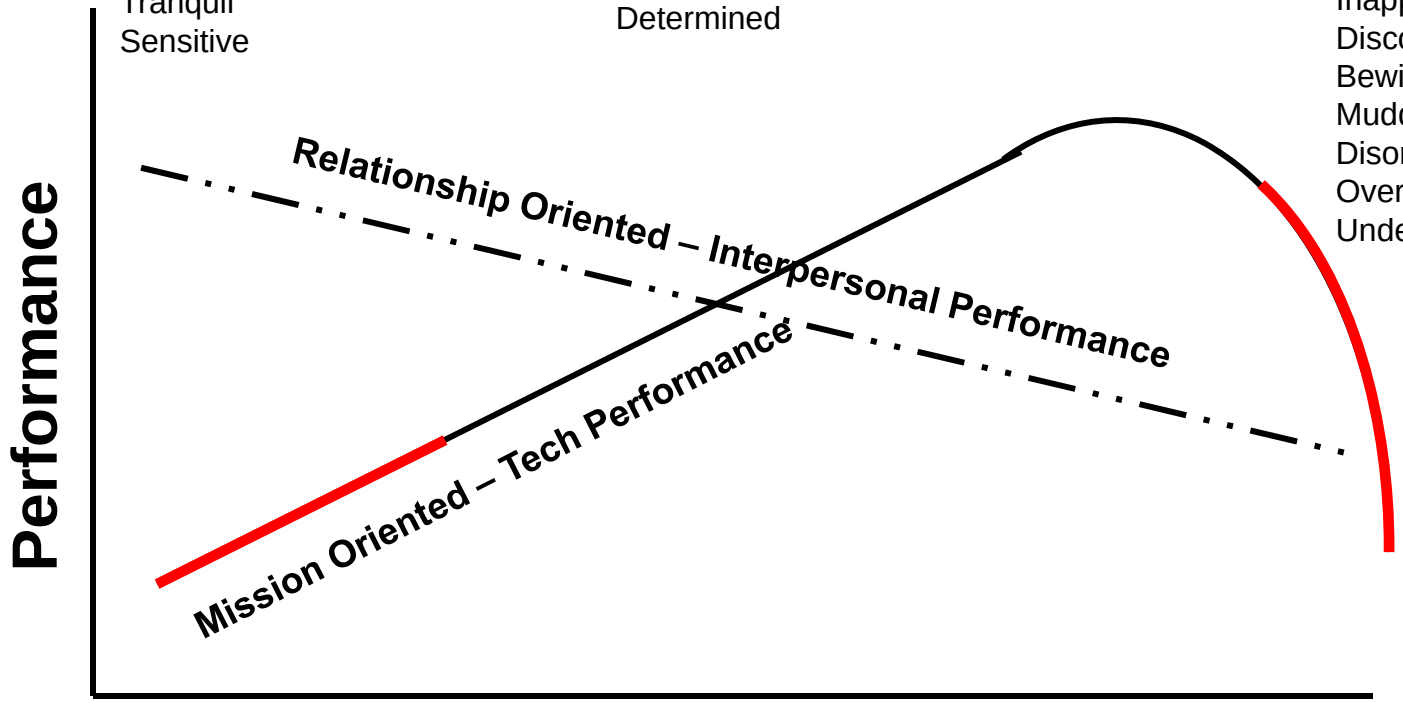
Pressure-Performance Curve

Loose
Relaxed
Open
Reflective
Tranquil
Sensitive

Decisive
Strained
Focused
Tense
Determined

Narrow attention
Memory capacity reduced

Inappropriate
Disconnected
Bewildered
Muddled
Disorganized
Over Reactive
Under Reactive



Usually Rapid Change →

← Usually Slow Change

Berlin, 2002

Five Don’ts of Level III Professionalism

1. Don’t give up the ethical high ground of compliance. Ever.
2. Don’t assume excellence, or even competence.
3. Don’t get lost in process, you’re more than a cog in a wheel. Own your job and decision space.
4. Don’t compare yourself with others to justify your level of performance.

Don’t make it all about you, the door to true performance opens outward.

(Dr. Kern, 2016)

The Last Man on the Moon: Earning the Title of “Professional”

Your Time is Valuable

- You did not have to be here today…
- You've already taken the first step…
- Thank you for your time and attention!