Can You Control Your Bias?
Subliminal Actions of the Brain that Can Affect Case Work

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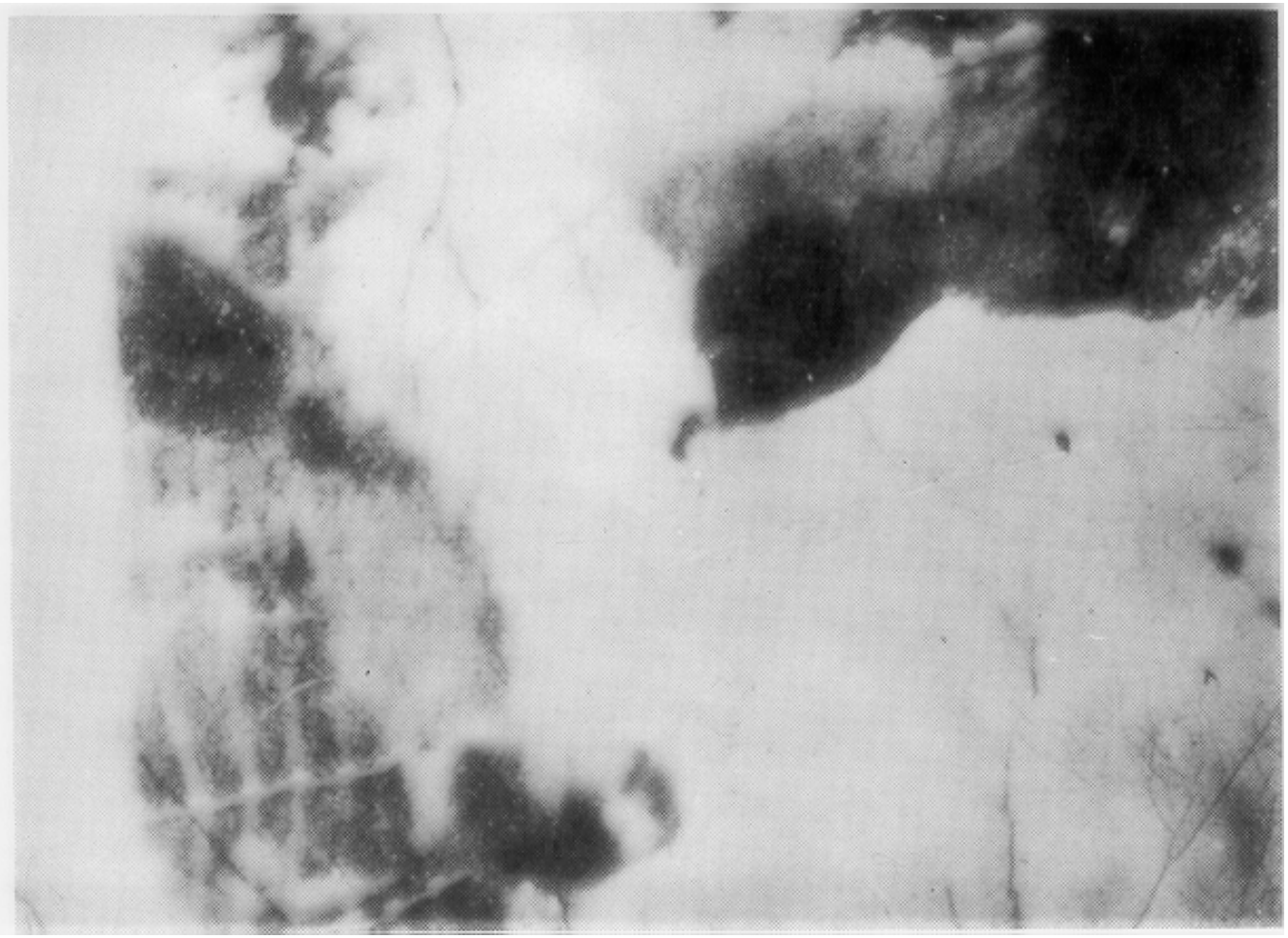
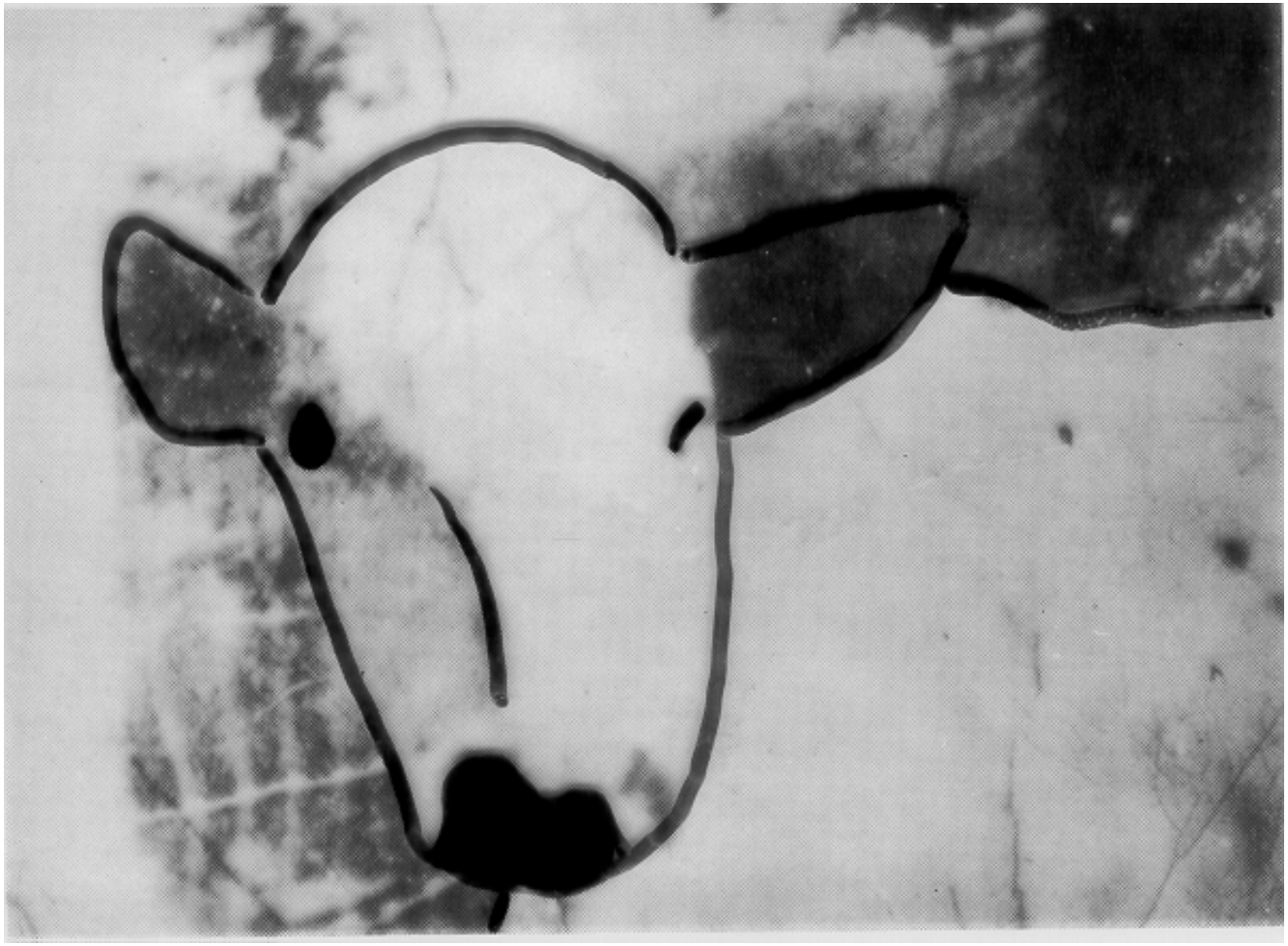
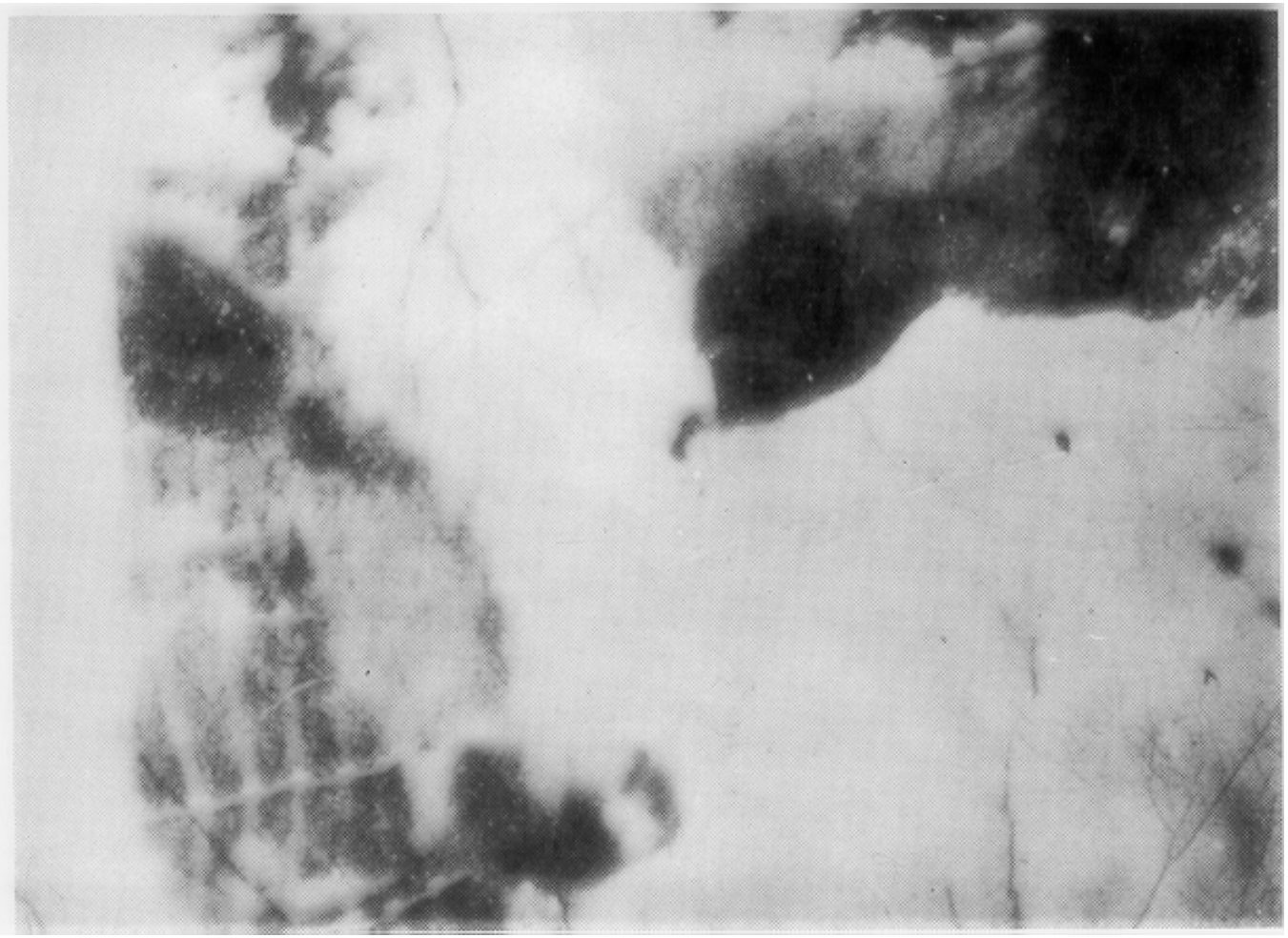
Can you see what is in this picture?



It’s a cow



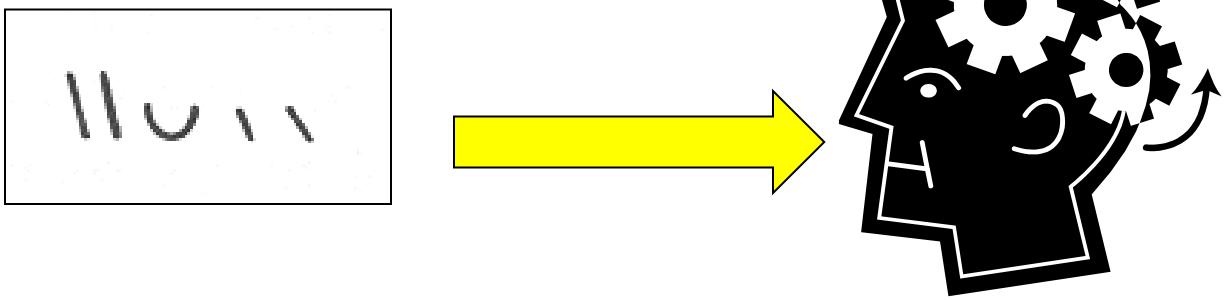
Can you see it now?



Raise your hand if you think you know what this word is

Can you tell what the second word is?

Why does this happen?



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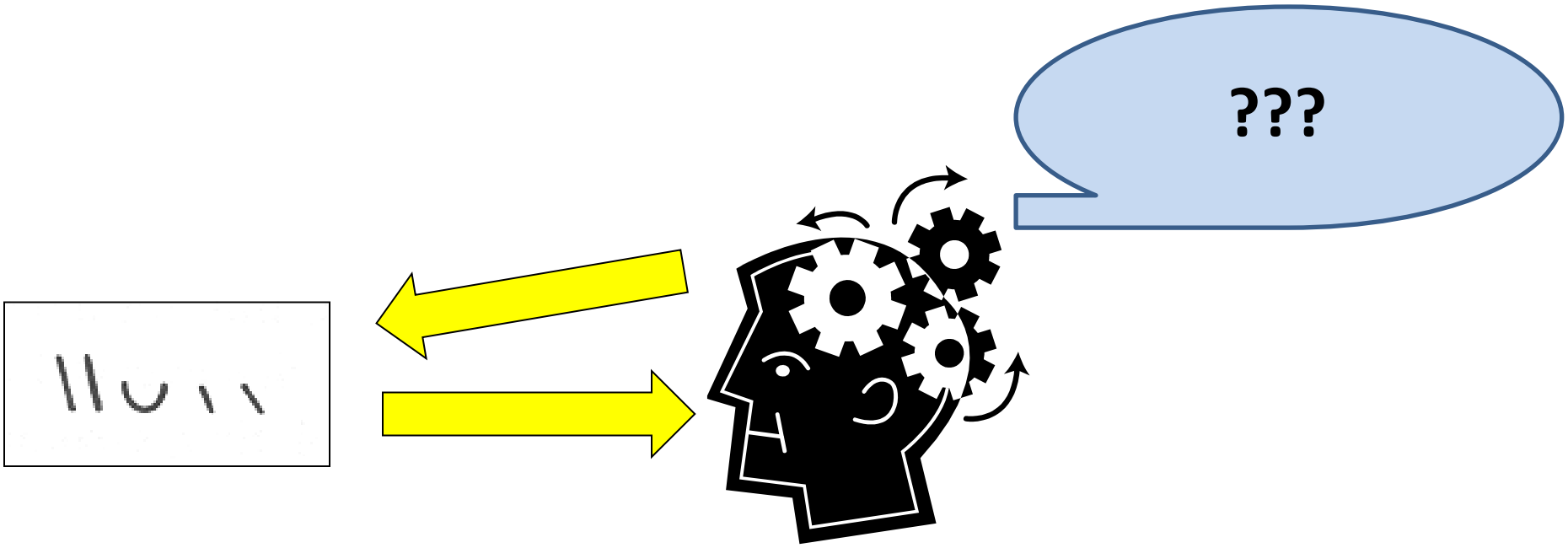

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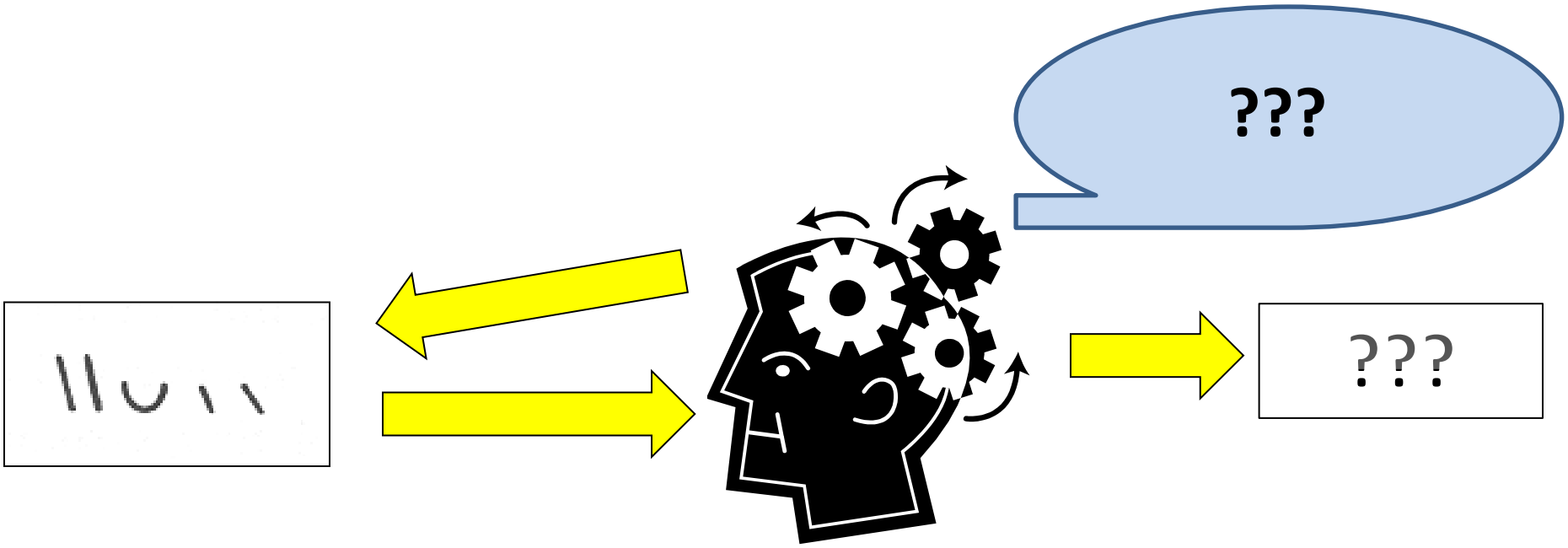

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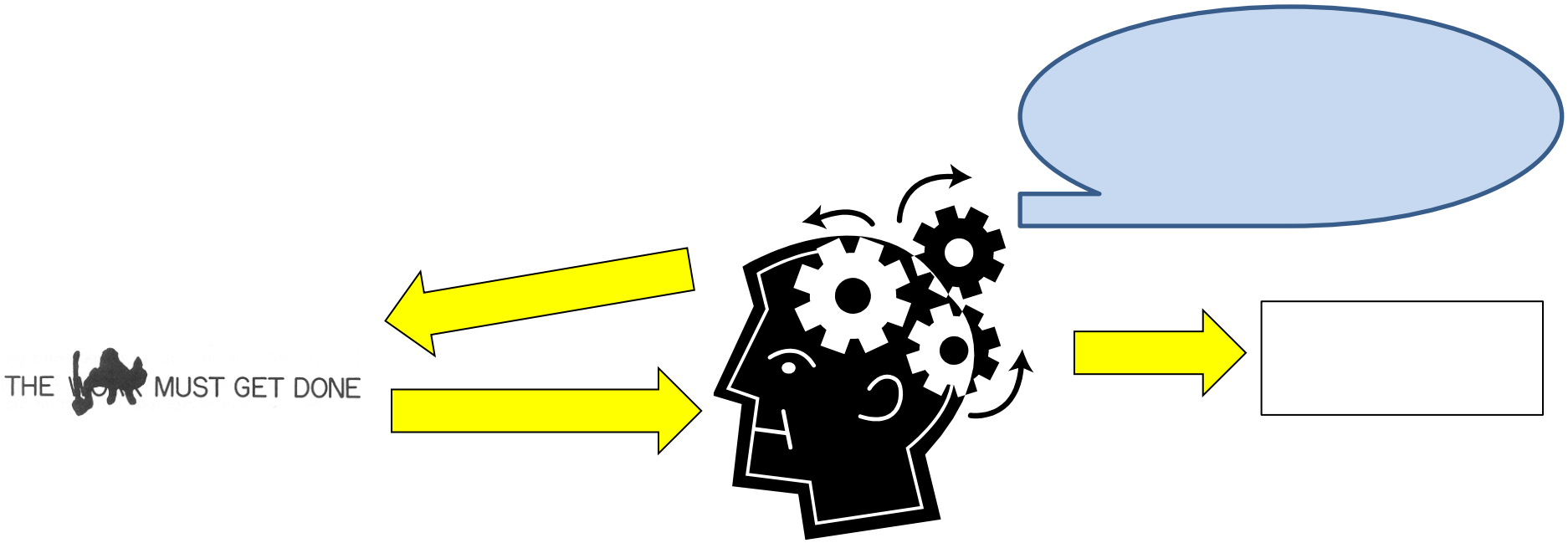

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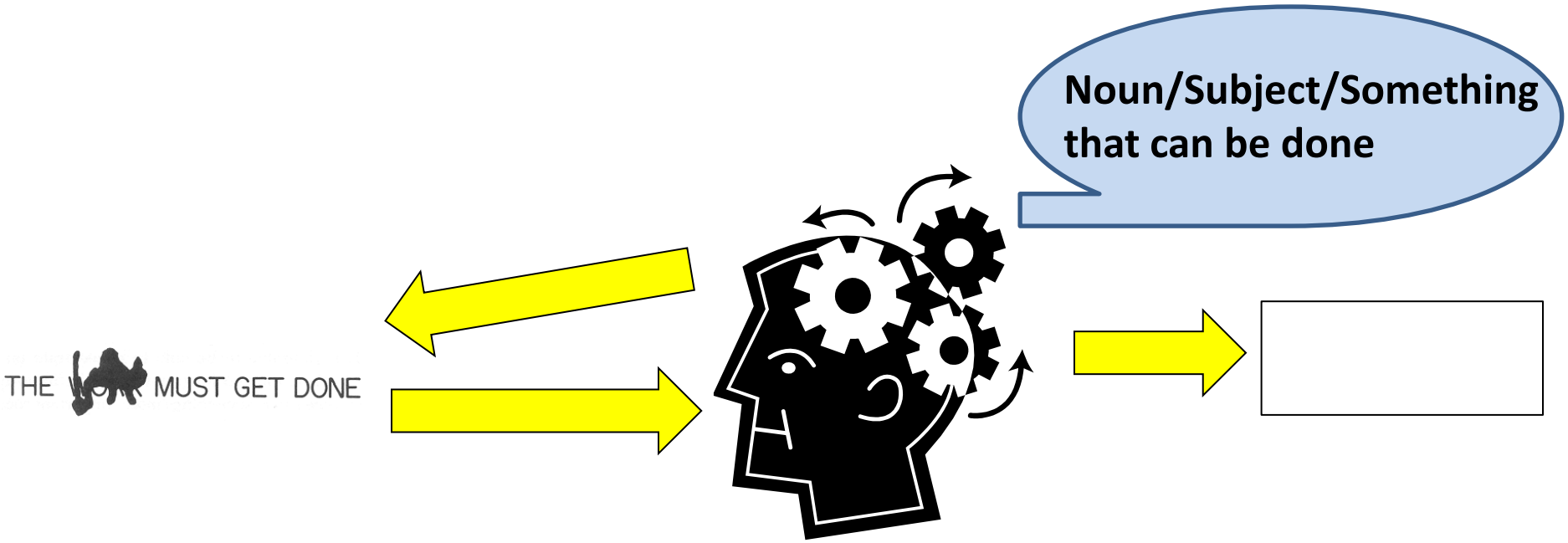

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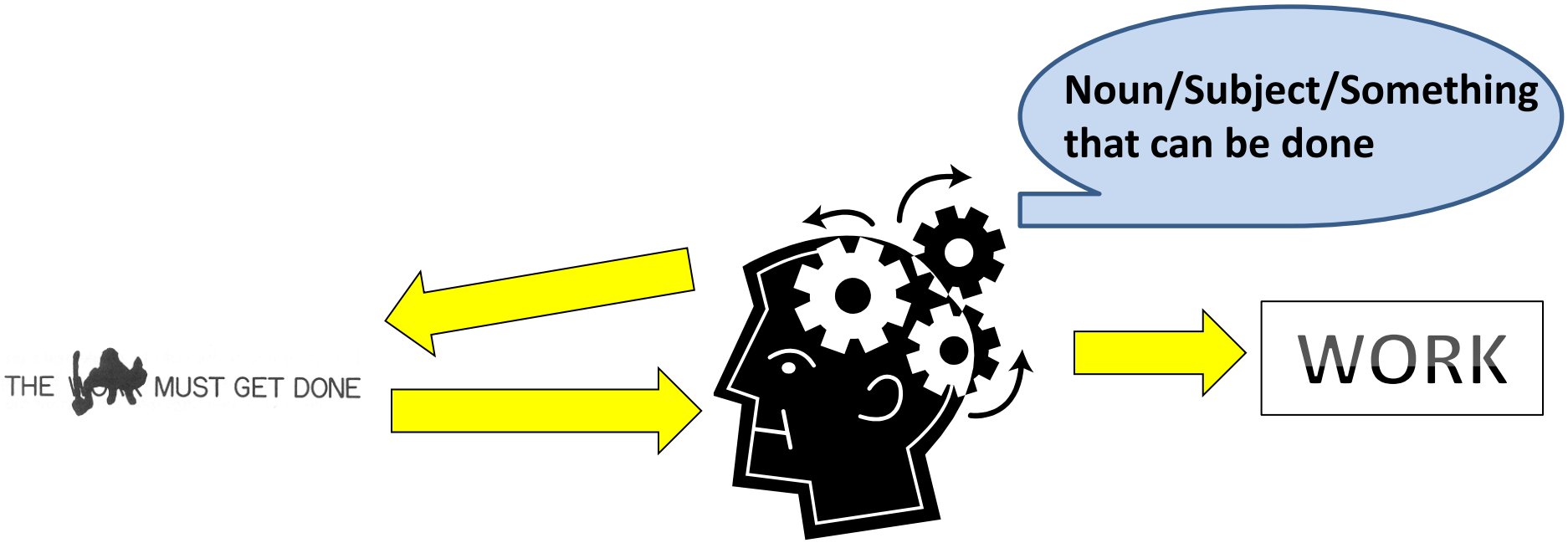
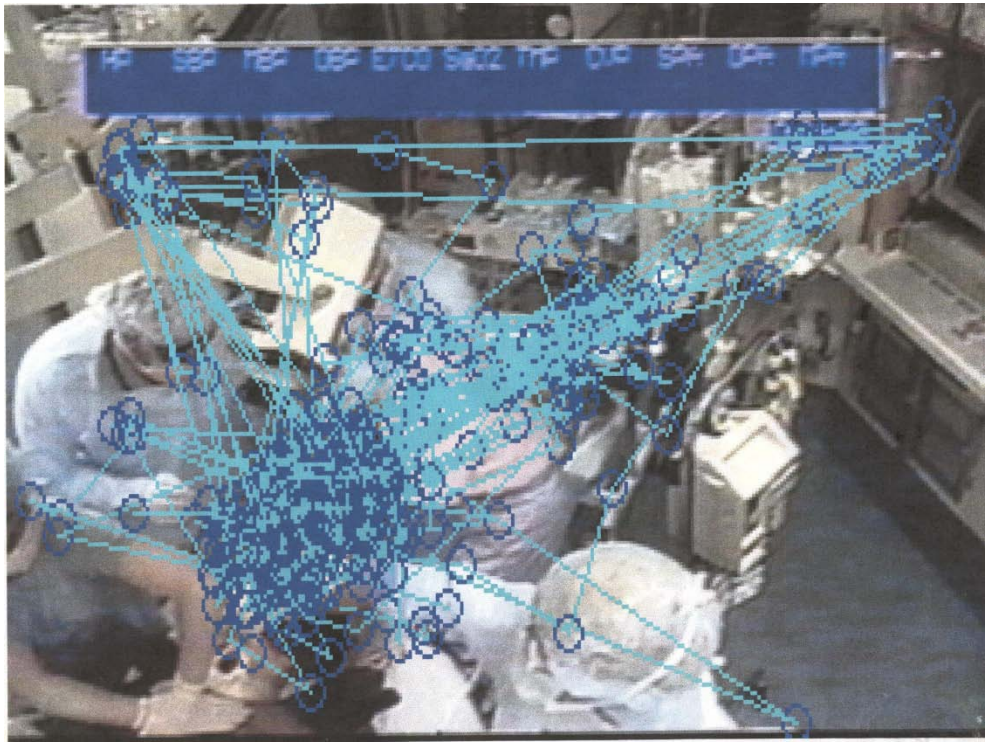


Contextual Influences

- Result from the way in which we process information
- Based on data derived from psychological research
- Can lead to misunderstandings or missing critical information
  - For example…

What do we see in our environment?



The lines illustrate the path a nurse's eyes took while watching a video replay of an actual resuscitation in the emergency room

We don’t see everything

The lines are shown here for an anesthesiologist watching the same playback

Contextual Influences

- Result from the way in which we process information
- Based on data derived from psychological research
- Can lead to misunderstandings and missing critical pieces of information
- Can also lead to “bias” in the way we process information

Biases vs. Heuristics

- Biases
  - Systematic distortions
  - Lead to sub optimal decision making
- Heuristics
  - Mental “shortcuts” that usually work adequately, (but not perfectly)
  - May be considered optimal under time pressure, or when cognitive resources are limited

Biases

- Fixation/anchoring
- Confirmation
- Salience/availability
- Overconfidence

Poison or aspirin?

- Three bottles
  - 2 aspirin; 1 poison
    - p (aspirin) = 67%
    - p (poison) = 33%
  - Probability of symptoms:
    - If you took poison, p = 80%
    - If you took aspirin, p = 5%

- You have symptoms…
  - What is the likelihood that you took poison? Aspirin?

Fixation/anchoring bias

- Fixation: inability to take a new perspective on a problem

- Anchoring: Decision maker *anchors* their belief that “a” is correct, because it is supported by the first arriving cue
  - Less likely to shift beliefs with subsequent cues

Bayes' theorem

$$P(\text{Poison/Symptoms}) = \frac{P(S/P)\,P(P)}{P(S)}$$

P(Sym/Poi) = .80 P(Sym/Asp) = .05

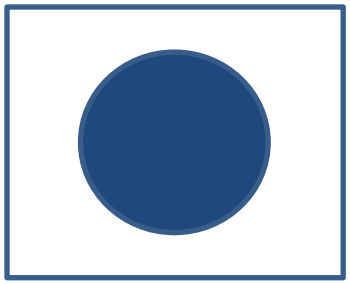
P (Poi) = .33 P (Asp) = .67

P (S/P) P(P) = .80 * .33 = .264

P (S) = (.80*.33) + (.05*.67) = .2975

P (Poison/Symptoms) = .264/.2975 = .887 = **88.7%**

Which ones need to be turned over?



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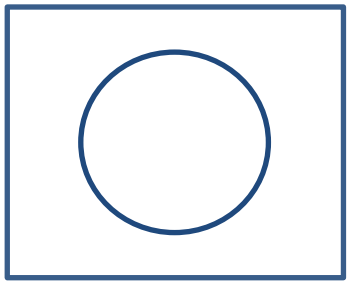

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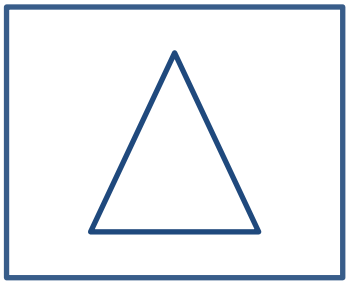

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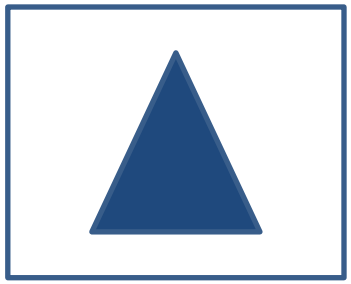

4

If there is a filled triangle on one side, there is an unfilled circle on the other side

(assuming that all cards have a circle on one side and a triangle on the other)

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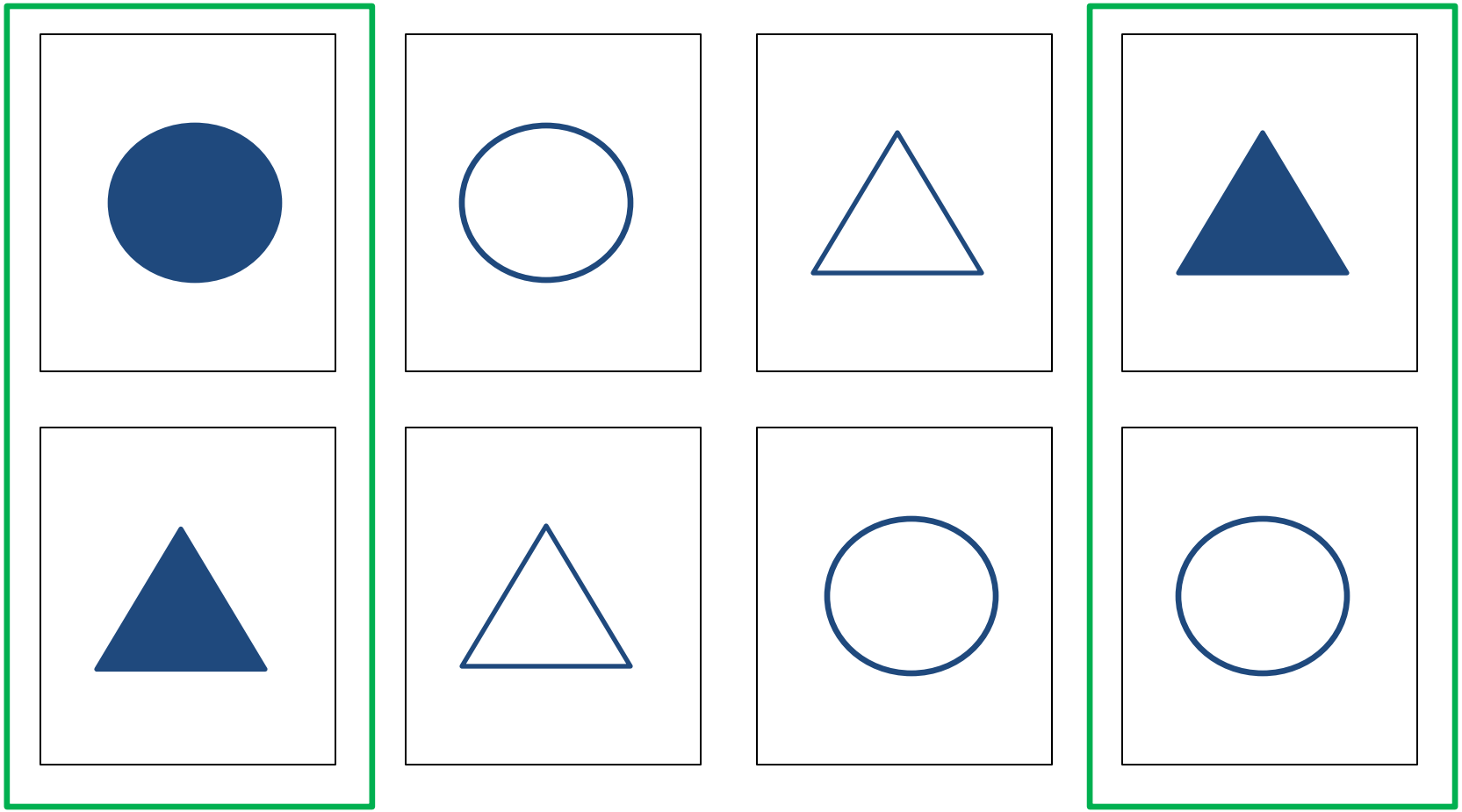


Confirmation bias

- Tendency to seek subsequent information to confirm that “a” is the correct diagnosis

- People do not look for, nor identify, cues that might support an alternate interpretation
  - if they find them, they “discount” them

Are you more likely to die from…

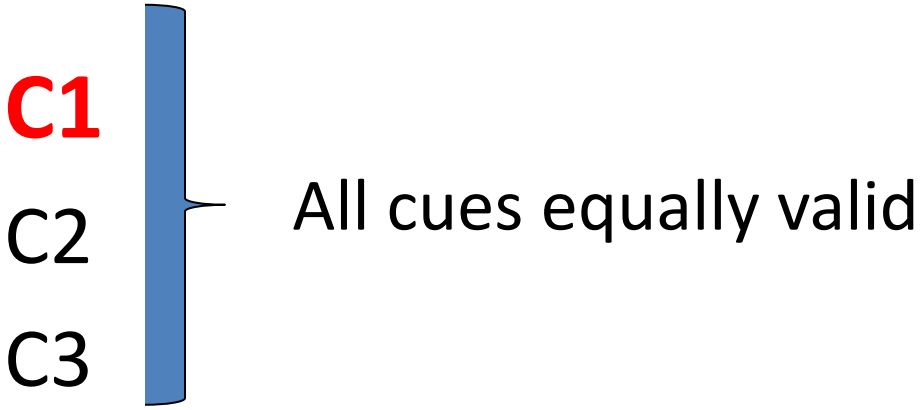
(based on deaths per 100 million Americans in 2009)

- Homicide or Parkinson's?
- Falls or accidental poisoning?
- Motor vehicle accidents or breast cancer?

Deaths per 100 Million Americans

- Homicide (16,591) or Parkinson's (20,552)?
- Falls (24,834) or accidental poisoning (30,504)?
- Motor vehicle accidents (36,284) or breast cancer (41,115)?

Saliency/availability bias



- What makes cues salient?
  - The loudest voice in the room
  - The brightest alarm flashing in central vision (Three Mile Island)
  - The smoothest, most articulate eye witness
  - The cue that arrives first

Overconfidence bias

- Decision makers are *overconfident* in the accuracy of their diagnosis

- As a result, they prematurely stop seeking additional information, since they “know they are right”

I Feel 98% sure that…

- The number of operating nuclear plants in the world is more than ___ and less than ___.
- The number of countries with nuclear power plants is more than ___ and less than ___.
- The number of medals Norway won in the 2010 Winter Olympics was more than ___ and less than ___.

Overconfident?

- The number of operating nuclear plants = 442
- Number of countries with nuclear power plants = 30
- The number of medals Norway won = 23

Biases in Latent Print Analysis

- Fixation/anchoring
  - Less likely to shift views in light of new information
- Confirmation
  - Tendency to look for confirming clues
- Salience/availability
  - Some cues more salient than others
- Overconfidence
  - Tend to believe that we are right

Context plays a role in Forensics Work

Context 1	**Context 2**
He confessed to the crime	Someone else confessed to it
An eye witness identified him	Someone else was identified
The detective ‘knows’ he is guilty	The detective thinks it is not him
	

1093I, 540

REQUEST FOR EXAMINATION
OF PHYSICAL EVIDENCE
SP-997-C (Rev. 10/83)

Department of Public Safety
Division of State Police
Forensic Laboratory
[redacted]

FOR LABORATORY USE ONLY
Lab # [redacted]
Receipt # 43038

SUBMITTING AGENCY: [redacted]
ADDRESS: [redacted]
TELEPHONE NUMBER: [redacted]
CASE NUMBER: 93 43156

TYPE OF CRIME/INCIDENT: Homicide
LOCATION: [redacted]
DATE: [redacted]

CASE PREVIOUSLY SUBMITTED? [ ] YES [x] NO
IF YES, LAB ID#:

EVIDENCE EXAMINED BY ANY OTHER AGENCY?
[ ] YES [x] NO

VICTIM(S) NAME	D.O.B.	RACE	SEX	SUSPECT(S) NAME	D.O.B.	RACE	SEX
[redacted]	12/21/59	W	M	[redacted]	2/25/75	B	M

DPS SCIENTIFIC SERVICES
2008 AUG 8 A 8:
EVIDENCE RECEIVING

SUMMARY OF CASE: While procuring drugs in the city this victim was shot in his vehicle, which the suspect reportedly drove prior to the shooting. The victims prints and his wife's were eliminated. Also a friend who had been in the vehicle.

LIST ITEMS SUBMITTED BELOW (NOTE: Each item must bear an evidence tag or label.)

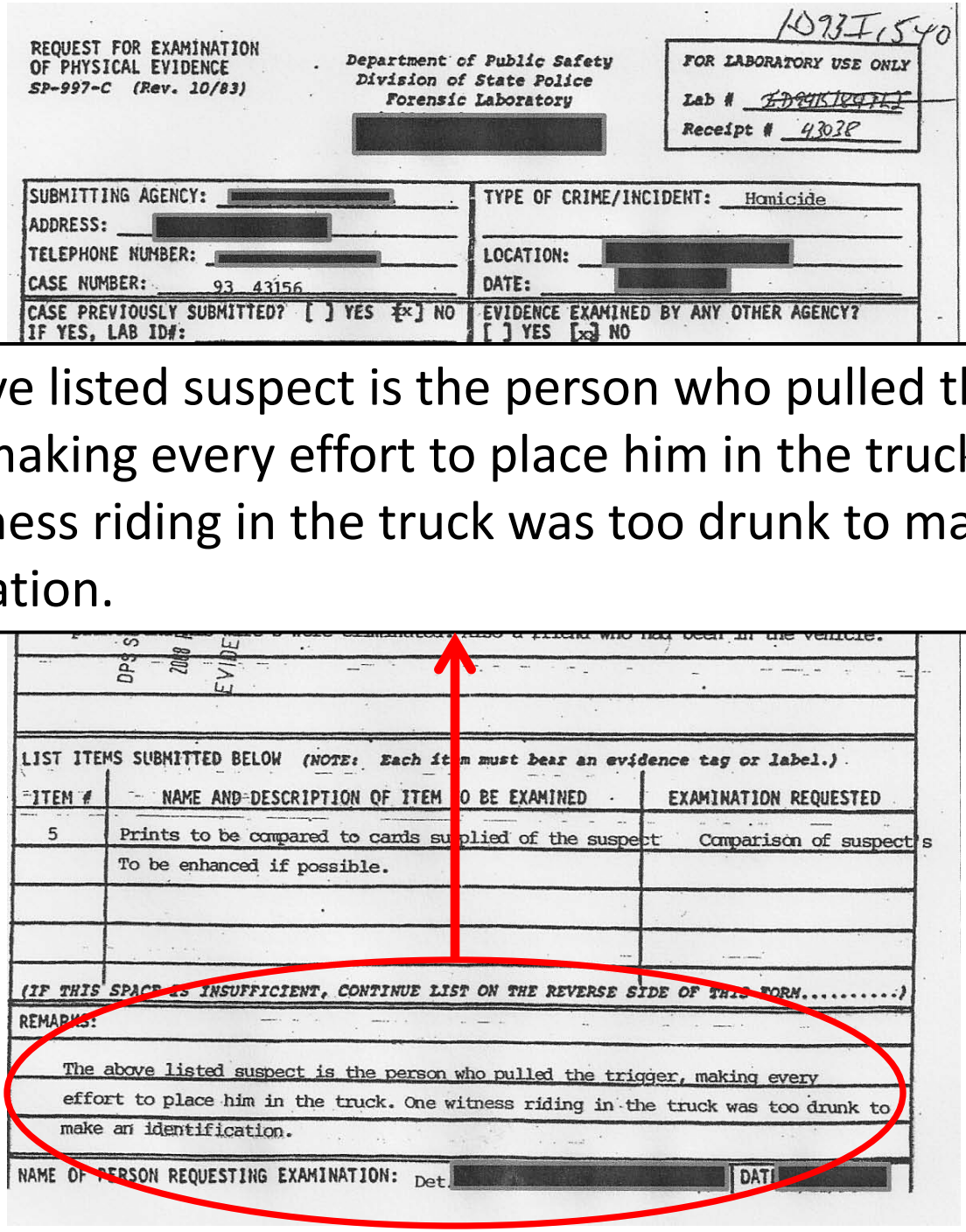
ITEM #	NAME AND DESCRIPTION OF ITEM TO BE EXAMINED	EXAMINATION REQUESTED
5	Prints to be compared to cards supplied of the suspect	Comparison of suspect s
	To be enhanced if possible.	

(IF THIS SPACE IS INSUFFICIENT, CONTINUE LIST ON THE REVERSE SIDE OF THIS FORM.....)

REMARKS:

The above listed suspect is the person who pulled the trigger, making every effort to place him in the truck. One witness riding in the truck was too drunk to make an identification.

NAME OF PERSON REQUESTING EXAMINATION: Det. [redacted] DATE [redacted]



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Experimental Results

- Examiner conclusion changed on 5 of 47 total judgments
  - Dror & Charlton, 2006; Dror & Rosenthal, 2008

- Four of five judgments of “match” changed to “no match” with change in context
  - Dror, Charlton & Peron, 2006

Summary of contextual influences

- Context (or lack thereof) can lead to
  - Misunderstanding of the system
  - Missing critical information
  - Bias
- Bias is not intentional, and it is without awareness
  - Not an ethical issue
  - Awareness by itself does not solve the problem

Implications

- Identification of “match” versus “no match” influenced by context
  - Information provided by investigators
  - Source of potential matches
    - People likely to be connected to the crime
    - AFIS
  - “History” of the prints
    - e.g., already identified by another analyst
- Need to be careful