
COGNITION IN ACTION

COGNITION IN FORENSIC SETTINGS POLICE LINE-UPS

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WHAT INFLUENCES AN EWS ABILITY TO ID A SUSPECT?

- Eyewitness memory importance
- Eyewitness suggestibility
- Recognising suspects: Police line-ups
- Recognising suspects: Describing faces
- Police questioning and interviewing techniques
- Violence & Weapon Focus

EYEWITNESS IDENTIFICATION

- After an event, a witness is asked to recognise (identify) a suspect
 - Usually from a line-up
- Signal Detection Theory (SDT) applies to their memory and decision.

SIGNAL DETECTION THEORY (SDT)

		Perceiver's response	
		"Yes"	"No"
Stimulus	Present	Hit	Miss
	Absent	False alarm	Correct rejection

- (Green & Swets, 1966; Macmillan & Creelman, 2005).

SIGNAL DETECTION

-
- Perfect performance: No misses or FAs.
 - But not always easy to distinguish signal from noise.
 - Target detection latencies also taken into consideration.
 - Can be critical in real-life scenarios
 - Premise of signal detection:
 - When a stimulus or signal occurs, it creates a neural response.

WHAT IS SIGNAL DETECTION?

- Neural noise constantly fluctuates, so brain must decide if neural activity reflects noise alone or also a signal.
- When a stimulus is difficult to detect, cognitive factors become critical.
- However, there will always be a trade-off between hits and FAs
- We must consider number of times a person claims to detect a target when it is not there (FA rate), just as much as correct detection of a target that is present (Hit rate).
- WHY?.....

SIGNAL DETECTION

- Detection ability is calculated as a probability from the hit and false alarm rates:
 - 20 signals presented, 5 hits & 15 misses = $5/20 = 0.25$
Hit rate
 - 10 noise trials, $1/2$ were “yes” response = $5/10 = 0.50$
FA rate
- By combining hit & FA it produces an index of **response criterion** placement.....
 - Observers' willingness to respond affirmatively.

SIGNAL DETECTION

- It determines observers' response characteristic
 - Conservative
 - Liberal
- Low hit & false alarm rates =
 - More *conservative* in response.
- High hit & false alarm rates =
 - More *liberal* in response.
- Reduction in hit rate but steady/increase FA rate = observer is not good at distinguishing between two types of events.

SIGNAL DETECTION THEORY

- The detectability of the signal depends on the difference between the means of the noise plus signal and the noise alone distributions.
- This is known as **d' (d prime) – the index of sensitivity**.
 - The greater the overlap between the distributions, the lower the d value and the more difficult it is to discriminate signal from noise.

SIGNAL DETECTION THEORY (SDT)

Signal absent

Signal present

Noise

*Signal +
Noise*

*Correct
Reject*

Hit

*d' = Pronounced
“dee prime”*

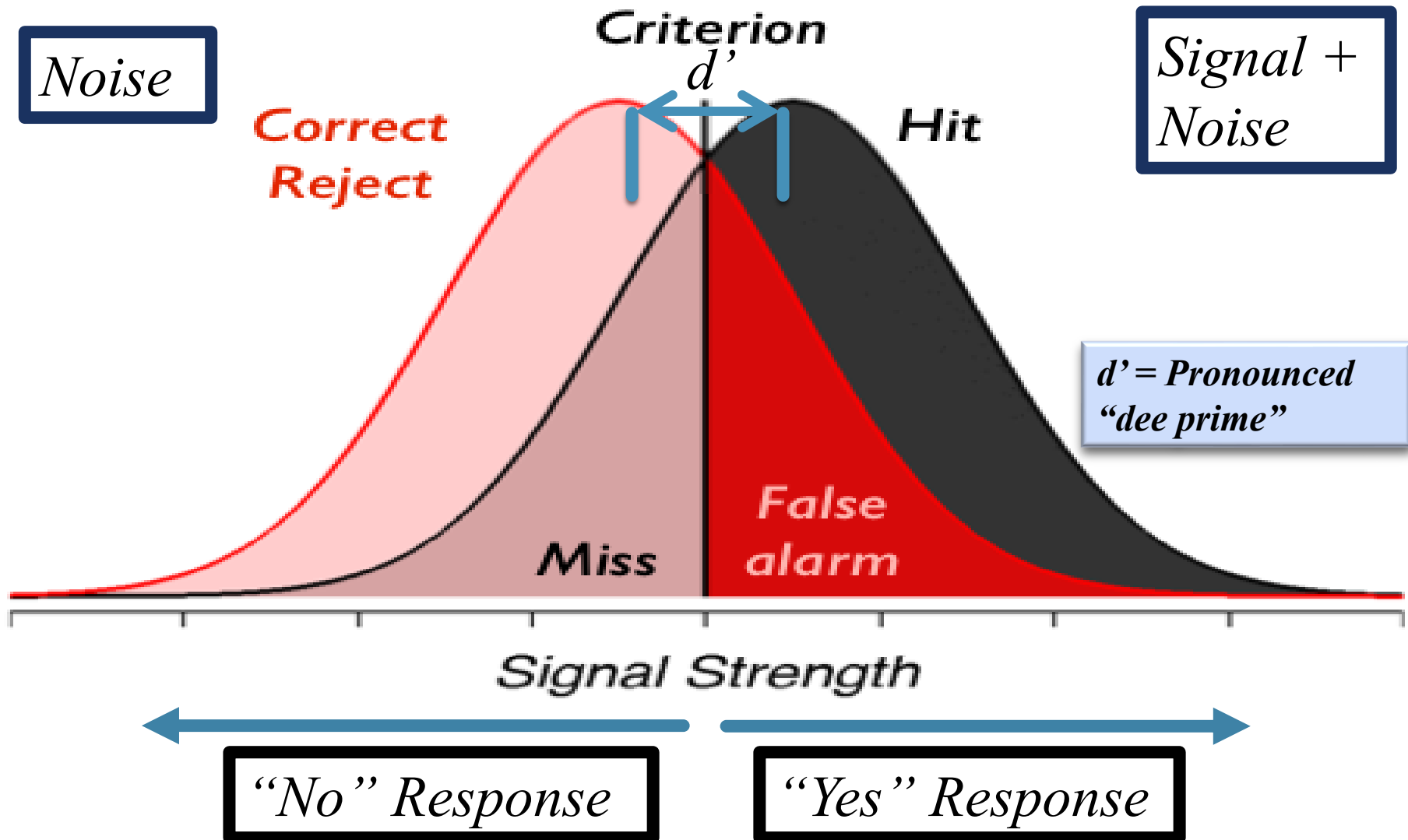
Miss

*False
alarm*

Signal Strength

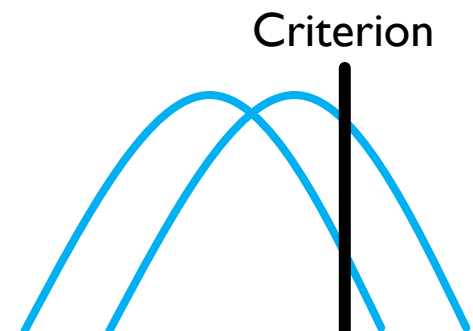
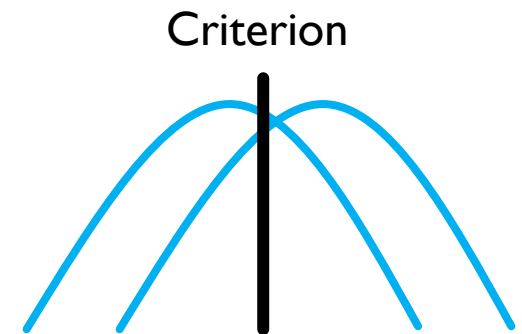
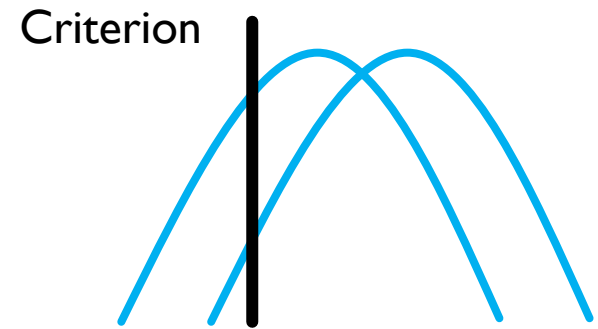
“No” Response

“Yes” Response



SHIFTING THE RESPONSE CRITERION

- People may set themselves specific criterion levels during detection decision scenarios.
- Only when that threshold is reached will a person decide to respond “yes” to the possibility of a signal.
- Notice there is no way of setting the criterion to achieve only hits & no FAs.



EW RESPONSE MATRIX

Eyewitness Response

**Suspect
is:**

	"Yes"	"No"
Present	Hit	Miss
Absent	False alarm	Correct rejection

RELEVANCE

- Criminal justice system and protection of society served by maintaining high level of sensitivity, while beta is kept neither:
- Too high = many misses would lead to criminals going free.
- Too low = greater FA would lead to innocent people being convicted of crimes they did not commit.

POLICE LINE-UP

- Most common method to identify a suspect:
- Line-up: EW presented with number of individuals
 - One is suspect
 - Remainder are “foils”
- A two-stage process
 1. Is suspect in line-up?
 2. If so, which person is the suspect?

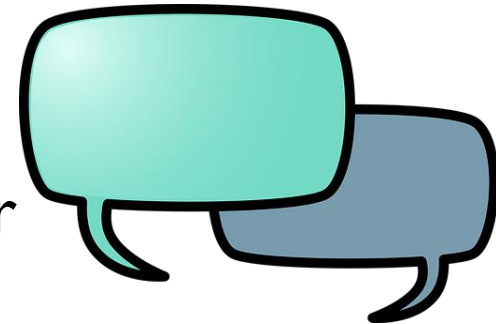


POLICE LINE-UP

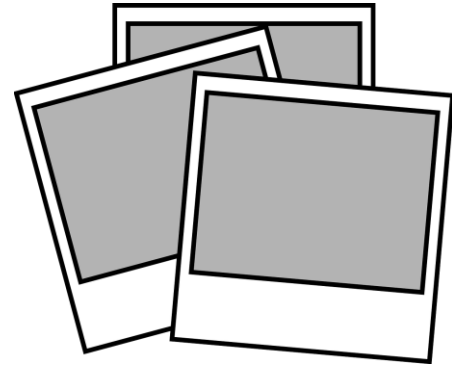
- Variables impacting line-up process:
 - Presentation method:
 - Simultaneous vs. sequential; live vs. pictures
 - Instructions provided to witnesses
 - Content
 - Behaviours

EFFECT OF LINE-UPS

- Inappropriately designed line-ups impact EWs ability to ID a suspect
 - May use external cues rather than memory
- Wells et al., (1994):
 - Verbal descriptions should be obtained prior
 - Foils should resemble suspect description
 - Clothing of members in line-up must be considered
 - Instructions must not be biased



EFFECT OF LINE-UPS



- Cutler et al., (1989):
 - Photographic line-ups inferior to live
 - But correct IDs roughly similar in both, and.....
- Photographic line-ups have following advantages:
 - Suspect/foils/EW not required at police station
 - Easier to make fair due to larger pool of photographs
 - Those in live line-ups can inadvertently draw attention

EFFECT OF LINE-UPS

- Simultaneous line-ups:
 - Risks witness using **Relative judgment** Strategy:
 - Selecting person most like “memory” of culprit – process of elimination (Lindsay, 1999).
 - May be acceptable if culprit **is** in line-up.
 - But – if true culprit not in line-up = False alarm.



Wells & Olson (2003)

EFFECT OF LINE-UPS

- Sequential line-ups:
 - Encourages conservative response criterion (Lindsay & Wells, 1985; Steblay et al., 2001).
 - EWs do not know size of line-up - discourages relative judgements.
- But, hit rate will be reduced (Grondlund et al., 2009; Meissner et al., 2001).

EFFECT OF LINE-UPS

- Memon & Gabbert (2003): 30% drop in accuracy with sequential.
- Wells (2003): only a % of accurate IDs in simultaneous line-up come from relative judgement.
 - EW with weak memory may still choose suspect – EW guessing will still be correct certain % of the time.
 - But this EW may not be able to ID suspect in sequential line-up
 - An EW in sequential line-up usually has strong memory
 - “Guessers” are not present in sequential line-ups.
- Drop in accuracy is due to removal of weak witnesses: which is a good thing!

EFFECT OF LINE-UPS

- Line-up number:
 - Large enough to avoid guessing innocent person.
 - Usually, one suspect and at least five foils
 - But foils need to be acceptable
- Luus and Wells (1991): foils that resemble suspect promote similarity, making it difficult to ID suspect
 - EW needs to make use of extra-recognition information

EFFECT OF LINE-UPS

- Technique to identify weak witnesses = “Dual line-ups”:
 - First line-up is “blank”
 - Target absent
 - If EW does not choose anyone, target present line-up then goes ahead.



LINE-UP INSTRUCTIONS

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- Telling an EW the suspect may **not** be in line-up reduces FAs – i.e., mistaken identification (Malpass & Devine, 1981).
 - US dep. of justice has added this instruction to set of guidelines for law enforcement (Technical Working Group for Eyewitness Evidence, 1999).

LINE-UP OUTCOMES

- Speed of decision: 10-12 second rule:
 - Dunning & Perretta (2002) – time to ID suspect linked to accuracy....
- Fast (<10-12 seconds) – automatic and likely accurate
- Slow – conscious deliberate process – perhaps justify choice to themselves?



EW CONFIDENCE

- Once EW makes selection, usually told if they have selected suspect.
- This can impact confidence levels in their judgement
- Wells and Bradfield (1998): post-identification suggestions lead to “false certainty” that culprit was correctly identified.
- Even when true culprit not in line-up, FAs accompanied by inaccurate overconfidence in judgement.

EW CONFIDENCE

- When these EWs appear in court to testify against a suspect:
 1. They are more convinced suspect is culprit
 2. Jury more easily convinced by their confidence

General assumption:

Highly confident EW = accurate EW
(Cutlet al., 1990; Wells et al., 1979).



EW CONFIDENCE

- Wells and Murray (1984): no significant relationship between confidence of EW and accuracy.
 - Jury should **not** use confidence as measure of accuracy.
- Wells and Olson (2003): Line-ups should be administered by someone who does not know which line-up member is suspect (or if present).

OPTIMALITY HYPOTHESIS

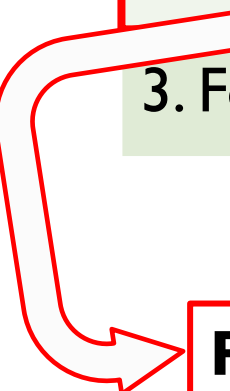
- Factors affecting quality of memory influence confidence
- Confidence accuracy relationship strongest when encoding and retrieval conditions are optimal.
 - Length of time to view suspect (Deffenbacher, 1980)
 - Distinctiveness (Cutler & Penrod, 1989).
- However: quality of “foils” in line-up impact CA

OPTIMALITY HYPOTHESIS

Line-up Conditions	Mean Confidence
1. Foils like witness description	3.68
2. Foils like suspect	3.80
3. Foils resemble neither	4.46



Accuracy



**Police usually use this – Should they?
Does it bias choice?**

Wells et al. (1993)

MODERATOR VARIABLES

- Wells et al. (1993): foil selection influences accuracy while confidence related to encoding conditions.
 - Good encoding conditions = higher confidence
 - Good line-up conditions = better accuracy
- Lieppe (1980)
 - Some factors affect accuracy without affecting confidence
 - E.g., post-event misleading info
 - Other factors influence confidence without affecting accuracy
 - E.g., post-event questioning



POST LINE-UP FEEDBACK

- Confidence can be altered in opposite way:
 - E.g., “Are you really sure?” “Do you want another look?”
 - Wells and Bradfield (1998, 1999)
 - Influences memory retrospectively.
- Garrioch & Brimacombe (2001): Line-up administrators can also influence confidence without any post-ID feedback.
 - E.g., through intonations, tone of voice, agitation, other non-verbal behaviour.



POST LINE-UP FEEDBACK

- Can work to advantage by testing EWM
- EWs with strong memory not influenced by post-ID feedback (Bradfield et al., 2002).
 - Strength of internal cues to accuracy vs. external cues.
 - When internal cues weak, EWs rely on external cues
 - EWs with poor memory use info during line-up to make decision

LINE-UP INSTRUCTIONS AND WITNESS EXPECTATIONS

- Memon, Hope, and Gabbert (2002):
 - Despite explicit instruction suspect may be absent
 - 90% still expected suspect to be present
 - 95% remember hearing the 'suspect may be absent' instruction
 - 17% felt under pressure to choose anyway
 - 78% would make same decision in real-life line-up
 - 47% were incorrect in decision
- Social influences cannot be easily overcome, and witness expectations can undermine good practices