The Science of Eyewitness Evidence

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What’s the problem?
The Innocence Project

343 DNA exonerations
70% involved eyewitness error
www.innocenceproject.org
What goes wrong? The scientific perspective

REAL WITNESSES MAKE ERRORS

Field studies (11): 1/3 positive IDs are fillers
  ◦ A known error
  ◦ Probably underestimates error
What goes wrong? The scientific perspective

DIFFICULT FOR EYEWITNESS TO RECOGNIZE THE ABSENCE OF THE CULPRIT IN THE LINEUP

- DNA cases: “Traditional” identification procedures
- Witnesses picking from culprit-absent lineups

A lineup is inherently risky for an innocent suspect
What goes wrong?  
The scientific perspective

WITNESSES OFTEN EXHIBIT HIGH CONFIDENCE, EVEN FOR MISTAKEN IDENTIFICATIONS

Witness is sincerely convinced (but wrong)
Jurors/judges have difficulty discerning who is accurate and who is not
What goes wrong?
The scientific perspective

MEMORY MYTHS

Very few people have a basic understanding of how memory works and of how particular factors affect eyewitnesses,

They are very wrong in their intuitive judgments.
“It’s burned into my mind!”

Memory as videotape:

“...remembering a traumatic event is like a video recording in that one can recall details as if they had been imprinted or burned into one’s brain.”

“The witness on the stand is effectively narrating a video recording of events in the “mind’s eye.”

◦ “I never forget a face.” (66%)
Reliance on witness confidence

The one factor that science shows is NOT a reliable indicator of accuracy in witness testimony is the one that jurors consistently use to evaluate eyewitness evidence.
"I would remember that!"

Stress and memory
For jurors with these core beliefs: not obvious

- Limits to human perception and memory
- Reconstructive memory process
- Confidence inflation
- These processes are rather seamless...so witness will not recognize influences on memory
- Memory errors by omission, also by commission
The Evaluation of Eyewitness Evidence

*State v. Henderson* (2011)
- *New Jersey Supreme Court; Special Master’s Report*
- How to properly evaluate the reliability of an eyewitness identification to determine whether it would be admitted in trial.

*Oregon v. Lawson* (2012)
- Requires that courts act in a manner consistent with the scientific evidence
National Academy of Sciences (2014)
  ◦ Eyewitness science

Recent decisions in Massachusetts, Connecticut
  ◦ Limit In-court IDs
What is the scientific evidence?

Laboratory experiments
- Control to isolate effects, establish cause and effect
- Knowledge of “ground truth”

Meta-analysis
- Combined data across labs
- Detect reliable patterns across the studies
- Note and understand the exceptions

Field experiments

Archival data (DNA exonerations)
Central questions

How reliable is eyewitness memory?
Why do eyewitnesses make errors?
Can eyewitness error be prevented?

- How does memory work?
- Controllable/Uncontrollable factors
- Procedures do matter
- Confidence and accuracy
Why do eyewitnesses make errors?

Stages of Eyewitness Memory:

At time of crime: (cannot control)
   Perception
   Encoding

At time of investigation: (can control)
   Retention
   Retrieval
3 points of time for analysis

At the time of the crime
- Was the witness able to perceive and encode a clear and detailed memory of this suspect?

Between crime and identification
- Was there memory interference or loss during the retention interval?

At the time of identification
- Were there influences that prompted the witness to pick from the lineup and to specifically pick this suspect?
How does memory work? (How are eyewitnesses vulnerable?)

Demand on eyewitness: to generate a detailed and coherent narrative of what happened and who is responsible

Memory and decision processes that are adequate for us most of the time may not work ideally for eyewitnesses
Attention
Estimator variables: time of the crime

Witness

Culprit

Crime
Estimator variables

Witness
  ◦ Visual acuity
  ◦ Intoxication
  ◦ Paying attention?
  ◦ Stress
Estimator variables

Culprit

◦ Stranger
◦ Transformed faces: Disguised, changed appearance
◦ Cross-race
Estimator variables

Crime
  ◦ Illumination
  ◦ Distance
  ◦ Duration

  ◦ Weapon
  ◦ Multiple perps
  ◦ Complexity
Memory as Trace Evidence

Memory, the Hidden Crime Scene
Memory as Trace Evidence

Seal off area (no interference)

Take samples carefully (special procedures)

Experts only (trained in memory principles)
  ◦ Every exchange: vulnerable to contamination

Immediately, not later (samples deteriorate)

Don’t mix samples (keep witness isolated)

Store safely (Memory will decay, change)

Retrieve with care (don’t lose it, ruin it)
Retention interval
From crime event to lineup

- Longer time = more forgetting
- Longer time = opportunity for interference
Memory is lost...

![Graph showing the percentage of list retained when relearning over time. The graph indicates a steep drop initially, followed by a gradual leveling off.]

Hermann Ebbinghaus (1850–1909)
Memories are reconstructed

Based on current knowledge
Fill in the gaps, with context, expectations
Memory is easily subject to contamination from external, post-event information
Likely to recall information, forget source
New information replaces old memory
Loftus: in the train station

Two females left a large bag on bench.
Confederate appeared to lift item from the bag;
Female: “oh no, my recorder is missing.”

1 week later, “insurance adjuster” called witnesses
>50% recalled seeing the item (didn’t exist)
Nearly all could describe in great detail
Vivid memory for a non-existent item
System Variables: retrieval

Procedural factors

- Crime scene
- Witness interviews
- Identification procedures
Recognition vs. Reasoning

Lineup is a recognition task: “Is this the guy?”

Not a reasoning task: “Can I figure out who the suspect is?”
Problem of non-recognition decisions

- Co-witnesses
- Non-blind lineup administrator
- Line-up instructions
- Repeated lineups: which photo is common to lineups
- Process of elimination
- Relative vs. Absolute judgment

How do we know that relative judgment occurs?
Can eyewitness error be prevented?
Bias in Lineup Procedures

**General** bias prompts witness to make ID

- Biased instructions
- Relative judgment (Simultaneous presentation)

**Specific** bias prompts witness to ID a specific person

- Show-up (or all-suspect lineup)
- Biased lineup construction
- Non-blind lineup administrator
- Repeated identification tasks with a common suspect
Recommendations include...

Lineup construction:
- Only one suspect per lineup + 5 fillers
- Match each filler to description
- Suspect should not stand out

Lineup instruction
- “The person you saw may or may not be in this lineup...”
Double-Blind

- Lineup administrator does not know who the suspect is (nor does the witness)

Sequential presentation (one-at-a-time)

Confidence measure immediately at time of identification and before feedback

Full documentation
How does this work in the field?
A Test of the Simultaneous vs. Sequential Lineup Methods

An Initial Report of the AJS National Eyewitness Identification Field Studies

GARY L. WELLS, NANCY K. STEBLAY, and JENNIFER E. DYSART

www.ajs.org/
Do Any Of These Individuals Look Familiar To You?

Yes
No
Not Sure
Does This Person Look Familiar To You?

1

[Image of a person]
## Results: Eyewitness decisions

<table>
<thead>
<tr>
<th></th>
<th>Sequential</th>
<th>Simultaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspect ID</td>
<td>23.4</td>
<td>26.0</td>
</tr>
<tr>
<td>Filler pick</td>
<td>11.1</td>
<td>17.8*</td>
</tr>
<tr>
<td>No pick</td>
<td>65.5</td>
<td>56.2</td>
</tr>
</tbody>
</table>

Sequential lineup significantly reduces mistaken identifications with no reduction in suspect identifications.
Field Experiment conclusions

Results consistent with decades of lab research

- Eyewitnesses are not very good at the ID task
- A lineup pick from a DB SEQ lineup is more probative: more likely to be the guilty suspect
Eyewitness confidence malleability
Witness Confidence

Investigator feedback taints witness confidence and memory

- Certainty, view, attention, and willingness to testify

The more suggestive the procedure, the more confident the witness

Suggestive system factors lead to distorted witness reports of estimator factors.
Summary:
Evaluation of Evidence

How well could this witness have encoded the event and the face of the culprit?

What types of interference may have affected witness memory and confidence between crime and lineup? Between ID and trial?

How might the identification procedures affect witness memory and confidence?
To understand an eyewitness:

Timeline: Follow memory stages

Conditions for encoding (estimator variables)

Contamination of trace evidence
  ◦ Changes in description, confidence
  ◦ Interactions with co-witnesses, feedback, etc.

Identification tasks
  ◦ Composite, show-up, lineup array, live lineup
  ◦ Include (non-surprising) court ID

Best practices? (system variables)
Thank you

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