

PLEA BARGAINING

1

Plea Bargaining

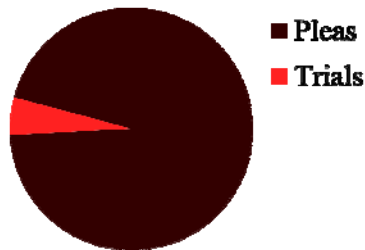
Definition:

- ❑ Agreement between a defendant and a prosecutor.
 - Defendant: Guilty plea in exchange for a “deal”.
 - Prosecutor makes the “deal”:
 - Drops one or more charges.
 - Reduces charge to less serious offense.
 - Recommends to judge specific sentence acceptable to defense.

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Plea Bargaining

**95% of
criminal
cases end in
a plea. Only
5% go to
trial.**



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Plea Bargaining

Benefits of Plea Bargains:

1. Fast.
 - A crowded system creates pressure to move cases through system quickly.
 - Plea bargains are resolved quickly.
 - Without plea bargaining, some say the criminal justice system would collapse due to overcrowding of the courts.

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Plea Bargaining

Benefits of Plea Bargains:

2. Cheap.
 - Resolving cases quickly saves \$ because the prosecutor can move more cases through system for same salary.

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Plea Bargaining

Benefits of Plea Bargains:

3. Outcome relatively certain.
 - Trial outcome is unpredictable.
 - Plea bargains give the defense and prosecution some control over the outcome.

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Plea Bargaining

Benefits of Plea Bargains:

4. Good deal for a guilty defendant.
 - Plea deal will result in better outcome than will a guilty verdict at trial.
 - But, for innocents there are costs....

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Plea Bargaining

Costs of Plea Bargains for the Innocent:

1. Limited grounds for appeal.
2. Become ineligible for social services.
3. Hidden financial costs.
4. Criminal record.

Rejecting plea:

- Charges dropped.
- Found not guilty.
- Appeal.

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Plea Bargaining

Do innocent people ever accept plea deals to avoid the uncertain outcome of a trial?

Proponents say no....

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Plea Bargaining

Proponents believe that innocent suspects reject plea deals due to confidence of acquittal at trial.

Converging evidence from several sources indicates that this assumption is false.

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Plea Bargaining

1. Self-Report: Defendants who plead guilty report that they did so because:
 - Believed a guilty verdict was likely.
 - Prosecutor threatened them with many charges and/or severe punishment.
 - Feared severe punishment if case went to trial.

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Plea Bargaining

Implicit message: One factor driving acceptance of plea deals, even among the innocent, is fear of harsh sentence if found guilty at trial.

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Plea Bargaining

Valid concern:

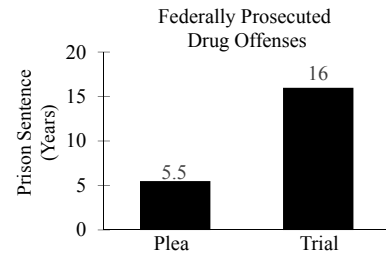
Plea deals are always less severe than expected sentence at trial.

The larger the differential, the more pressure defendants are under to accept the plea.

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Plea Bargaining

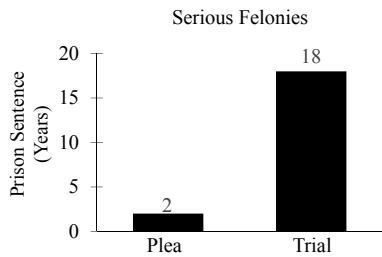
How large are the differentials?



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Plea Bargaining

How large are the differentials?



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Plea Bargaining

2. Experimental Research:

Indicates that innocent defendants plead guilty to avoid harsh punishment.

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Plea Bargaining

How does innocence and expected sentence at trial influence the plea rate?

- Hypothesis 1: Innocent defendants plead guilty to avoid harsh punishment.
- Hypothesis 2: The harsher the expected sentence at trial, the higher the plea rate.

Dervan & Edkins, 2012

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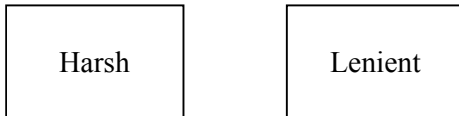
Plea Bargaining

- ☐ Cheating paradigm.
- ☐ Guilty vs. innocent behavior.
- ☐ Accusation of misconduct.
- ☐ A plea deal offered.
- ☐ Sentence severity manipulated.

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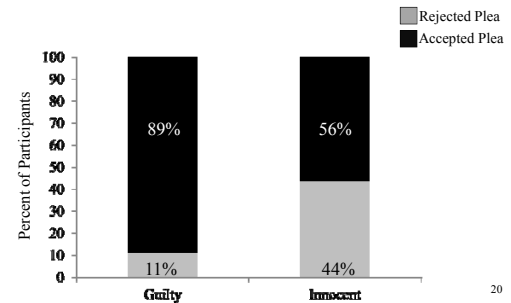
Plea Bargaining

- Sentencing severity manipulation:



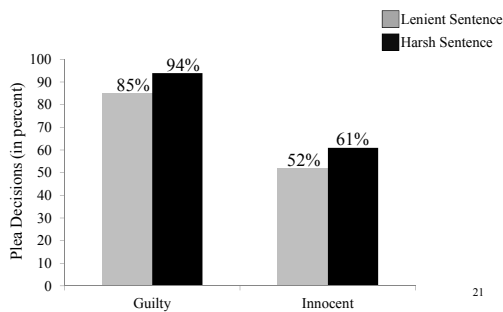
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Plea Bargaining



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Plea Bargaining



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Plea Bargaining

3. Anecdotal cases:

Real legal cases also show that innocent defendants sometimes plead guilty.

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Plea Bargaining

Conclusion: Innocent defendants do sometimes plead guilty. They do it because:

1. Fear harsh punishment if convicted at trial.

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Plea Bargaining

- A guilty plea often means immediate release from jail for low-level crimes.
 - Most crimes are minor and have short sentences.
 - Some defendants cannot afford bail, and must await trial in jail.
 - Length of pre-trial detainment often exceeds expected sentence if convicted at trial.

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Plea Bargaining

Brady v. United States (1970):

In 1967, Brady appealed his sentence on grounds that his plea was not voluntary.

- Counsel exerted impermissible pressure.
- His plea was induced by promise of a reduced sentence (i.e., avoid death).

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Plea Bargaining

Brady v. United States (1970):

Ruling: Court affirmed prior decision.

"A plea of guilty is not invalid merely because entered to avoid the possibility of the death penalty, and here, petitioner's plea of guilty met the standard of voluntariness, as it was made 'by one fully aware of the direct consequences' of that plea."

Justice White, on behalf of the unanimous Court

Plea Bargaining

❑ Types of Plea Bargains

1. Fact Bargaining
2. Sentence Bargaining
3. Count Bargaining
4. Charge Bargaining

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Plea Bargaining

1. Fact Bargaining:

A defendant agrees to plead guilty in exchange for the prosecutor presenting a certain version of events to the court that will result in a more favorable sentence.

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Plea Bargaining

2. Sentence Bargaining:

A defendant agrees to plead guilty to the stated charge (not a reduced charge) in exchange for an agreed upon (lighter) sentence. This sentence can, however, be denied by the judge.

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Plea Bargaining

3. Count Bargaining:

A defendant pleads guilty in exchange for the dismissal of some (often redundant) charges that would be tried if the defendant goes to trial.

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Plea Bargaining

4. Charge Bargaining:

A defendant pleads guilty in exchange for a reduction in the severity of the charges against him.

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Plea Bargaining

☐ Alford Plea:

Defendant maintains innocence but admits that the state has sufficient evidence to convict and agrees to be treated as guilty.

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Plea Bargaining

North Carolina v Alford (1970):

- ☐ Was expected to plead guilty to 2nd degree murder, but did not:

Claimed instead that he had not killed Young and that he was only pleading guilty to avoid the death penalty.

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Plea Bargaining

North Carolina v Alford (1970):

- ☐ The trial judge accepted the plea.
- ☐ Alford appealed many times, claiming that his plea was involuntary, and made only to avoid the death penalty.
- ☐ Plea overturned, but NC appealed and case made it to the Supreme Court.

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Plea Bargaining

North Carolina v Alford (1970):

- ☐ In a 6 to 3 vote, the Court overturned the lower court's decision.

Alford's plea would stand as "guilty".

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Plea Bargaining

North Carolina v Alford (1970):

Majority opinion (6 votes):

"An individual accused of a crime may voluntarily, knowingly, and understandingly consent to the imposition of a prison sentence even if he is unwilling or unable to admit his participation in the acts constituting the crime." ...Justice Byron White

LIE DETECTION (Deception Detection)

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Lie Detection

❑ Deception:

An act or statement intended to make people believe something that is not true.

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Lie Detection

❑ Deception (lie) detection:

A way of distinguishing between truth and lies.

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Lie Detection

❑ Belief Perseverance

The tendency for people to cling to their original beliefs even when the information on which those beliefs are based is discredited.

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Lie Detection

❑ Dissonance

A feeling of psychological discomfort that people feel when their attitudes and behaviors do not match.

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Lie Detection

❑ Cognitive Dissonance Theory

Inconsistencies between attitudes and behaviors create dissonance. To reduce dissonance, people bring their attitudes and behaviors in line with one another.

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Lie Detection

- ❑ Judge originally held an attitude and did a behavior that matched:

Original testimony true (attitude)
Guilty man sent to prison (behavior)

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Lie Detection

- ❑ The new testimony challenged the Judge's old attitude.

Original testimony false (attitude)
Innocent man sent to prison (behavior)

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Lie Detection

- ❑ Two ways to reduce dissonance.

1. Change an attitude to match a behavior.
2. Change a behavior to match an attitude.

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Lie Detection

- ❑ To avoid feeling dissonance, maybe the judge rejected the new testimony.

Original testimony true (attitude)
Guilty man sent to prison (behavior)

NO DISSONANCE

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Lie Detection

- ❑ Case raises a fundamental question:

How good are people at detecting lies?

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Distinguishing Truth From Lies

Police are trained to believe that they are very skilled at detecting deception.

85% accuracy rate.

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Distinguishing Truth From Lies

~~85% accuracy rate.~~

People's ability to detect deception = Chance levels.

Training in deception detection does NOT help.

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Lie Detection

1. Mock crime vs. innocent behavior.

- ☐ Vandalism
- ☐ Shoplifting
- ☐ Breaking and Entering
- ☐ Computer Break-in

Kassin & Fong (2005)

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Lie Detection

A. Vandalism.

Participants wrote a derogatory and obscene message on the wall of a certain building in chalk, dropped the chalk, and walked away.

(Walked to the building, observed the message and walked away).

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Lie Detection

B. Shoplifting.

Participants entered a local gift shop and 'shoplifted' jewelry or a stuffed animal. The cooperating store owner pretended not to notice the theft.

(Entered the store, browsed, and exited. Looked inside a paper bag by the store's entrance and walked away).

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Lie Detection

C. Breaking and Entering.

Participants arrived at a certain campus building late at night, broke into the building and 'stole' the answer key to an exam.

(Went to the same building late at night, entered through the (unlocked) front door, and obtained a questionnaire).

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Lie Detection

D. Computer Break-in.

Participants were given the username and password of another student, entered a computer lab on campus, and logged into the student's account where they read three 'confidential' messages.

(Sat at the same computer and logged on to their own email accounts).

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Lie Detection

2. All participants were 'arrested' and 'interrogated' by a 48 yr. old man (Detective McCarthy).

Told to claim innocence and that if the interrogator believed them, they would receive \$5. If the interrogator did not believe them, told they would be detained at the security office on campus for 5 minutes.

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Lie Detection

3. Interrogations were taped. Detective explained why the suspect was being questioned and asked the suspect to describe her/his whereabouts when the crime occurred.

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Lie Detection

4. Detective refused all denials.

Detective challenged the suspect's responses, pointed out inconsistencies and omissions, & called the suspect a liar.

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Lie Detection

5. Observers watched 8 videotapes each, under one of two conditions.

Trained in
Deception
Detection

Not Trained
in Deception
Detection

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Lie Detection

Truthful:

- ☐ Faces interviewer straight on in chair.
- ☐ Arms and legs uncrossed.
- ☐ Comfortable changing posture.
- ☐ Uses both hands when gesturing.
- ☐ Makes good eye contact.

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Lie Detection

Deceptive:

- ☐ Turns body away; sits sideways.
- ☐ Arms and legs crossed.
- ☐ Rigid/frozen posture.
- ☐ Does not use hands to gesture.
- ☐ Grooming behaviors.
- ☐ Poor eye contact.

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Lie Detection

- Observers judged whether each tape was of a liar or a truth teller, and reported their confidence.

- Accuracy scores could range from 0 – 8.
 - 0 = All ratings wrong.
 - 8 = All ratings right.
 - 4 = Accuracy at chance level (50%).
- Confidence: How sure observers were that their judgments of liars and truth tellers was accurate.

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Lie Detection

	Trained	Not Trained
Accuracy	3.64	4.40
Confidence	6.55	5.91

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Lie Detection

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63

Lie Detection

	Trained	Not Trained
Accuracy	3.64	4.40
Confidence	6.55	5.91

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Lie Detection

- 20 male inmates participated video-taped interviews.

Meissner, Kassir, & Norwick (2005)

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Lie Detection

- There were 2 tapes made of each inmate.

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Lie Detection

3. Police officers (trained) and college students (untrained) viewed the videotapes and judged whether the inmates had told the truth or lied about their past criminal behavior.

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Lie Detection

For each tape, participants were asked:

1. In your opinion, is this individual **guilty** of the crime to which he has confessed or is he **innocent** of it and telling a false story?
2. How confident are you in your judgment?
(1 = Not at all; 10 = Very)

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Lie Detection

	Police (trained)	Students (not trained)
Accuracy	42%	53%
Confidence	7.65	6.18

69

Lie Detection

	Police (trained)	Students (not trained)
Accuracy	42%	53%
Confidence	7.65	6.18

70

Lie Detection

	Police (trained)	Students (not trained)
Accuracy	42%	53%
Confidence	7.65	6.18

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Lie Detection

1. People are not good at distinguishing truth from lies.
2. Specialized training in deception detection doesn't help.
3. Specialized training does make people overconfident in their judgments

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Lie Detection

Why are people no good at detecting lies?

Maybe liars and truth tellers do not differ very much in their outward behaviors.

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Lie Detection

❑ Hypothesis:

People are so good at lying that they do not show many outward signs of deception.

(DePaulo et al., 2003)

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Lie Detection

❑ Performed a meta-analysis of 120 studies.

All studies compared behavior while lying to behavior while telling the truth.

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Lie Detection

❑ Across the 120 studies, a total of 158 behaviors were examined.

❑ These behaviors were categorized into 5 groups.

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Lie Detection

1. Amount of information:

Do liars provide less information in their stories than truth tellers? (11 total behaviors)

Examples: Time spent talking
 Length of answers
 Length of conversation

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Lie Detection

Do liars provide less information in their stories than truth tellers?

YES, for 3 of 11 behaviors.

Liars talked for less time, included fewer details, pursed lips more than truth tellers.

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Lie Detection

2. Believability:

Do liars tell a less believable story than truth tellers? (36 total behaviors)

Examples: Story plausible
 Story logical
 Story contains inconsistencies

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Lie Detection

Do liars tell a less believable story than truth tellers?

YES, for 10 of the 36 behaviors.

E.g., Liars told stories that made less sense, were less logical, more inconsistent, less engaging, more repetitive, than stories told by truth tellers.

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Lie Detection

3. Attitude:

Are liars less positive and pleasant than truth tellers? (12 total behaviors)

Examples: Cooperative
 Head nods
 Smiles

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Lie Detection

Are liars less positive and pleasant than truth tellers?

YES, for 3 of the 12 behaviors.

Liars were less cooperative, made more negative statements, and made less pleasant facial expressions.

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Lie Detection

4. Anxious:

Are liars more anxious than truth tellers? (10 total behaviors)

Example: Nervous
 Blinking
 Voice tense

83

Lie Detection

Are liars more anxious than truth tellers?

YES, for 5 of the 10 behaviors.

Liars were more nervous, had more vocal tenseness, spoke in a higher pitch, had more dilated pupils, and had more general fidgeting.

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Lie Detection

5. Content of Lies and Truths:

Do lies include fewer imperfections and unusual events than truths? (13 total behaviors)

Examples: Correct self
 Unusual details
 Extra, unnecessary details

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Lie Detection

Do lies include fewer imperfections and unusual events than truths?

YES, for 3 of the 13 behaviors.

Liars made fewer spontaneous corrections, less often admitted not being able to remember information, and more often linked story to a related event.

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Lie Detection

A few other differences emerged (and some changed) when lies were about a transgression.

- Eye contact: Liars < Truth tellers.
- Foot/leg movement: Liars < Truth tellers.
- Fidgeting: Liars < Truth tellers.
- Blinking: Liars > Truth tellers.

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Lie Detection

❑ So, if liars and truth tellers differ, why can't people catch liars?

1. There are few differences in behavior, overall.

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Lie Detection

❑ So, if liars and truth tellers differ, why can't people catch liars?

2. Group differences may not apply to individuals.

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Lie Detection

❑ Polygraph: Measures physiologic arousal.

(AKA: Irrelevant-Relevant Test, Guilty Knowledge Test, and **Comparison Question Test**, depending on procedures).

All measure physiological indices of arousal while a person is asked and answers a series of questions.

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Lie Detection

❑ Polygraph:

Assumes that deceptive answers produce physiological responses that can be differentiated from those associated with non-deceptive answers.

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Lie Detection

❑ Polygraph procedures:

1. Pre-test interview

- Test procedure explained.
- Test described as infallible.
- Comparison questions asked to get baseline readings.

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Lie Detection

❑ Polygraph procedures:

Examples of possible comparison questions:

- Have you ever stolen a small object from your place of work?
- Have you ever been to a strip club?
- Have you ever smoked pot?
- Have you ever physically harmed someone?

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Lie Detection

❑ Polygraph procedures:

2. The Test

- Comparison questions and relevant questions are asked and physiological responding recorded.

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Lie Detection

❑ Polygraph:

Relevant questions: Related to the crime in question.

- Did you murder Sam?
- Did you bury the body behind the garage?

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Lie Detection

❑ Polygraph:

Expected pattern of responding:

- Guilty: More aroused by relevant questions than comparison questions.

Relevant > Comparison

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Lie Detection

❑ Polygraph:

Expected pattern of responding:

- Innocent: More aroused by comparison questions than relevant questions.

Comparison > Relevant

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Lie Detection

❑ Polygraph:

How accurate is the polygraph?

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Lie Detection

❑ Polygraph:

The American Polygraph Association claims that the polygraph has very high accuracy rates (80% to 98%).

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Lie Detection

❑ Polygraph:

National Research Council concluded that the polygraph can detect deception at levels only slightly better than chance.

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Lie Detection

❑ Problems with the polygraph:

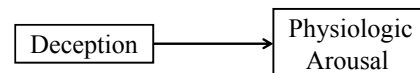
1. There is not a perfect correspondence between physiological responding and psychological states.

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Lie Detection

❑ Problems with the polygraph:

Just because this is true....

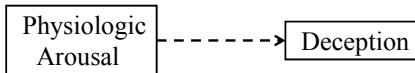


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Lie Detection

❑ Problems with the polygraph:

Doesn't mean this is....



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Lie Detection

❑ Problems with the polygraph:

Summary of Problem 1:

The same physiological reactions that may signal deception can arise for other reasons.

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Lie Detection

❑ Problems with the polygraph :

As a result, the polygraph yields MANY false positives.

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Lie Detection

❑ Problems with the polygraph:

2. Countermeasures can reduce the accuracy of the polygraph.

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Lie Detection

- ❑ 120 community participants (18-66 yrs.)
- ❑ Paid \$10 and promised another \$15 if passed the polygraph test.
- ❑ Mock crime vs. innocent behavior.
- ❑ Trained in countermeasures or not.

Honts et al. (1994)

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Lie Detection

Note attached to lab door, with instructions:

- Enter room, lock door, go into a closet, close the door, read and sign consent form.
- Tape recording: On a later date they would be given a polygraph test concerning their guilt or innocence of a simulated theft.

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Lie Detection

Innocent behavior

A rare coin had been stolen, but they did not take it.

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Lie Detection

Guilty (mock crime) behavior

Enter an office, search a desk, find a cash box, open the box, find and steal a rare coin, and then return to the room and wait for an assistant.

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Lie Detection

Guilty (mock crime) behavior

Trained in countermeasures

Not trained in countermeasures

111

Lie Detection

Countermeasures

Physical

Press toes to floor
Bite tongue

Mental

Count backward by 7s from large number

Begin countermeasure upon recognizing comparison question, stop just long enough to answer, continue until next question asked.

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Lie Detection

Created 3 conditions:

Innocent – Not Trained

Guilty – Not Trained

Guilty – Trained

1 week later, all participants subjected to a polygraph test.

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Lie Detection

Based on polygraph results, examiner classified participants as...

- Innocent.
- Inconclusive.
- Guilty.

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Lie Detection

	Innocent	Inconclusive	Guilty
Innocent No training	75%	15%	10%
Guilty No training	20%	10%	70%

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Lie Detection

	Innocent	Inconclusive	Guilty
Guilty Physical	55%	5%	40%
Guilty Mental	40%	15%	45%

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Lie Detection

Conclusions:

- High rate of inaccuracies even without countermeasures. (10% - 20% inaccuracy)
- With countermeasures inaccuracies extremely high. (40% - 55% inaccuracy)

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Lie Detection

❑ Problems with the polygraph:

1. Not a perfect correspondence between physiological responding and psychological states.
2. Countermeasures reduce the polygraph's accuracy.

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Lie Detection

❑ Polygraph:

Deception ≠ Guilt!

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Lie Detection

❑ fMRI: (Functional Magnetic Resonance Imaging)

- Shows usage of blood flow to the brain.
- When a part of the brain is being used, it requires more blood flow.

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Lie Detection

❑ fMRI:

Types of studies that have tested the fMRI as a lie detector:

- In response to questions, participants respond 'yes' when the answer is no, and vice versa, or answer truthfully.

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Lie Detection

❑ fMRI:

Types of studies that have tested the fMRI as a lie detector:

- In response to questions, participants spontaneously lie or tell the truth.

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Lie Detection

❑ fMRI:

Types of studies that have tested the fMRI as a lie detector:

- Participants state a rehearsed and memorized lie or tell the truth.

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Lie Detection

❑ fMRI:

Types of studies that have tested the fMRI as a lie detector:

- Participants steal one of two objects (ring vs. watch) and then lie about it.

124

Lie Detection

❑ fMRI:

Types of studies that have tested the fMRI as a lie detector:

- Some experiments increase participants' motivation to lie by offering incentives for 'beating' the machine.

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Lie Detection

❑ fMRI:

Most consistent finding: Lying increases activity in the Anterior Cingulate Cortex and Prefrontal Cortex. (85 – 90% accuracy)

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Lie Detection

❑ Problems with the fMRI:

1. fMRI depends on brain activity required to suppress a competing response.

Example 1:

Saying a falsehood while suppressing the truth.

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Lie Detection

❑ Problems with the fMRI:

1. fMRI depends on brain activity required to suppress a competing response.

Example 1:

Saying a falsehood while suppressing the truth.

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Lie Detection

❑ Problems with the fMRI:

But, people also inhibit a host of other responses such as thoughts and emotions. Concern that the tendency to suppress these responses might lead to false positives.

No research has tested this yet.

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Lie Detection

❑ Problems with the fMRI:

2. fMRI may not be able to show deception if a person believes the lie, such as if they are delusional or just wrong.
3. Deception \neq Guilt

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FORENSIC EVIDENCE

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Forensic Evidence

Forensic Science:

The application of science and technology to investigate events after the fact, using collected evidence.

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Forensic Evidence

Forensic Science:

In criminal cases, forensic science helps to establish the facts of a crime through evidence collected at the crime scene.

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Forensic Evidence

Examples of forensic evidence:

- Biological: e.g., blood, semen, saliva, hair, bone.
- Controlled substances: e.g., cocaine, heroin, meth.
- Impression: e.g., fingerprints, shoe and tire tracks.
- Tool marks: e.g., crowbar or screwdriver impression.
- Firearms: e.g., bullets, barrel markings.
- Fiber: e.g., polyester, cotton, jute, wool, nylon.
- Odontology: e.g., bite marks.
- Bloodstain pattern: e.g., angle of impact.

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Forensic Evidence

Sequence of collecting forensic evidence:

1. Crime scene investigators search for, find, and collect evidence at a crime scene.
2. Collected evidence is secured and preserved in *tamper-evident* packaging.
3. Collected evidence is sent to a crime laboratory for analysis.

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Forensic Evidence

Five goals of forensic analysis:

1. Identification: Categorizing what the evidence is.

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Forensic Evidence

Five goals of forensic analysis:

2. Individualization: Linking physical evidence to a particular person.

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Forensic Evidence

Five goals of forensic analysis:

3. Association: Linking a person to a crime scene.

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Forensic Evidence

❑ Five goals of forensic analysis:

4. Reconstruction: Understanding the temporal sequence of crime-relevant events.

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Forensic Evidence

❑ Five goals of forensic analysis:

5. Exclusion: Ruling out individuals or sources as a potential match.

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Forensic Evidence

❑ CSI Effect:

The exaggerated portrayal of forensic science on crime television shows influences public perception, causing jurors to expect and demand ultra-high-tech tests in order to convict suspects.

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Forensic Evidence

National Academy of Sciences Report....

With the exception of DNA, the validity of forensic evidence to achieve the five stated goals is either unknown or questionable.

Take fingerprint analysis.....

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Forensic Evidence

Fingerprint Analysis

1. Visual inspection determines whether:
 - Prints have sufficient detail for analysis.
 - If they do, then an evaluation of similarity is made by an examiner.
2. A second examiner repeats the process.

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Forensic Evidence

❑ Problems with Fingerprint Analysis

1. No pre-specified criteria exist.

Example:

The features subjected to evaluation are determined during the comparison, not a priori.

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Forensic Evidence

☐ Problems with Fingerprint Analysis

2. What may look like a mismatch may actually be the result of the impression process.

145

Forensic Evidence

☐ Problems with Fingerprint Analysis

3. The second evaluation is not always independent.

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Forensic Evidence

☐ Problems with Fingerprint Analysis

Confirmation bias....

Tendency for people to seek out information that confirms what they already believe to be true.

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Forensic Evidence

☐ Problems with Fingerprint Analysis

Confirmation bias....

In the case of fingerprint examiners, the first examiner's evaluation may cause the second examiner to develop a "hypothesis" that guides her/his evaluation of the print – focusing her or him more on similarities or dissimilarities.

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Forensic Evidence

- ### ☐ Tested whether fingerprint analysis can be biased by prior information.

Dror, Charlton, & Peron (2005)

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Forensic Evidence

Procedures:

- ☐ Five fingerprint experts examined a set of prints that they were told were the ones (erroneously) matched by FBI in the Madrid Bomber case.
- ☐ Implication: Prints do not match.

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Forensic Evidence

Procedures:

- ☐ In reality, the experts were shown prints that they had previously identified as a match.
- ☐ Fingerprints did actually match, verified by two other, unbiased, experts.

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Forensic Evidence

Procedures:

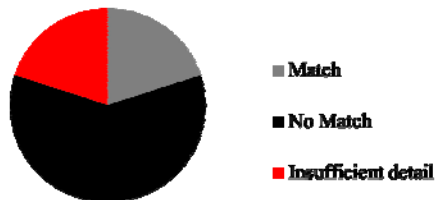
- ☐ Experts responded to this question:

Is there enough detail in the prints to make a definite, sound decision, and if so, what is that decision (match or no-match)?”

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Forensic Evidence

Results:



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Forensic Evidence

And it's not just fingerprints....

Several experiments have shown that evaluation of other kinds of forensic evidence can also be tainted by prior information.

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Forensic Evidence

- ☐ Hypothesis:

Forensic examiners are influenced by information given to them by police or attorneys requesting their services.

Miller (1984)

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Forensic Evidence

- ☐ Participants trained in forgery detection.
- ☐ Provided with “evidence” typical in check forgery cases:
 - Summary of case facts.
 - Three handwriting samples.
 - Three allegedly forged checks.
- ☐ In reality, there were no matches.

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Forensic Evidence

❑ Experimental manipulation of bias:

Bias Group:

Evidence from 1 suspect.
Witnesses identified him.

No-bias Group:

Evidence from 3 suspects.
No witnesses.

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Forensic Evidence

Results:

	Match	No Match	Inconclusive
Bias Group	66%	17%	17%
No Bias Group	0%	100%	0%

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Forensic Evidence

- ### ❑ Meta-analysis reported that the reliability of handwriting analysis was low, likely due to the considerable degree of subjectivity involved in the evaluation.

Dror & Rosenthal (2008)

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Forensic Evidence

Conclusion of National Academy Report:

1. Most forensic science techniques have never been tested for accuracy.
2. Those that have (except for DNA) have been shown to be subjective and open to biases.

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Forensic Evidence

❑ Expert Witness

Person with specialized knowledge, training, or experience who provides testimony in a legal case.

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Forensic Evidence

❑ Admissibility Standards

Requirements needed for expert opinion to be admissible in court.

1. Frye Rule
2. Federal Rules of Evidence
3. Daubert Standard

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Forensic Evidence

❑ Frye Rule (general acceptance test)

An expert may only provide testimony about scientific findings or techniques that are generally accepted as reliable in the relevant scientific community.

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Forensic Evidence

❑ Frye Rule

A finding or technique is “generally accepted” if it is:

1. Based on sound scientific principles.
2. Reliable.

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Forensic Evidence

❑ Frye Rule

Reliable:

Psychology: Able to be replicated or reproduced.

Law: Able to be trusted; believable; likely to be true or correct. (akin to psychology’s usage of ‘validity’ – e.g., a test (lie detector) is valid if it measures what it claims to measure (lies).

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Forensic Evidence

Verbal deception could be detected by changes in systolic blood pressure.

This was the first time anyone used any kind of an instrument to detect truthfulness or deception.

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Forensic Evidence

❑ Federal Rules of Evidence

“If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.”

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Forensic Evidence

❑ Federal Rules of Evidence

1. Less restrictive than the Frye Rule of general acceptance.
2. Encourages the admission of evidence.
3. Judges are the gatekeepers.

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Forensic Evidence

❑ An expert witness may testify if:

1. The expert's knowledge will help the trier of fact to understand the evidence or to determine a fact in issue.

(The findings are relevant and helpful)

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Forensic Evidence

❑ An expert witness may testify if:

2. The testimony is based on sufficient facts or data.

(The findings are objective, not opinion)

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Forensic Evidence

❑ An expert witness may testify if:

3. The testimony reflects reliable principles and methods.

(The findings are based on the scientific method – can be falsified, peer-reviewed)

171

Forensic Evidence

❑ An expert witness may testify if:

4. The expert has reliably applied the principles and methods to the facts of the case.

(The findings are being used properly)

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Forensic Evidence

❑ Daubert Standard:

Not all criteria must be met for expert testimony to be admissible. Judge is gatekeeper and makes the decision. Junk science can (and does) get in.

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Forensic Evidence

❑ Fraud in expert testimony of forensic evidence is a major problem.

One fraudulent forensic analyst can impact many, many defendants.

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Forensic Evidence

❑ DNA

Not all DNA is the same, and not all DNA tests are equally conclusive.

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Forensic Evidence

❑ DNA

DNA is a molecule that encodes the genetic instructions used in the development and functioning of all known living organisms.

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Forensic Evidence

❑ DNA

There are two types of DNA that can be used in forensic testing.

1. Nuclear DNA
2. Mitochondrial DNA

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Forensic Evidence

❑ Examples of nuclear and mitochondrial DNA:

Nuclear DNA

Mitochondrial DNA

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Forensic Evidence

❑ Nuclear DNA

Stored in the cell nucleus. Corresponds to a person's genetic code. Half of a person's nuclear DNA is inherited from the mother and the other half from the father.

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Forensic Evidence

❑ Nuclear DNA

Nuclear DNA is unique to a given person. Therefore, tests of nuclear DNA can identify the specific source of the DNA (individualization).

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Forensic Evidence

☐ Mitochondrial DNA

Stored outside the cell nucleus, in the mitochondria. Contains less of a person's genetic code than nuclear DNA. Mitochondrial DNA is inherited solely from the mother.

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Forensic Evidence

☐ Mitochondrial DNA

Mitochondrial DNA is not unique to a given person. All people with a common maternal relative have identical mitochondrial DNA. Therefore, tests of mitochondrial DNA cannot identify the specific source of the DNA (individualization not possible).

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Forensic Evidence

☐ Mitochondrial DNA

Mitochondrial DNA can, however, rule out possible sources.

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Forensic Evidence

☐ Nuclear and Mitochondrial DNA

Each cell contains only two copies of nuclear DNA, but thousands of copies of mitochondrial DNA.

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Forensic Evidence

☐ Nuclear and Mitochondrial DNA

Because nuclear DNA is less abundant, an insufficient quantity may be present for testing (e.g., degraded samples). However, testing of mitochondrial DNA may still be possible due to its higher abundance in the cell.

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Forensic Evidence

☐ Nuclear DNA testing and bias

When nuclear DNA evidence is clear and decisions simple, the potential for contextual information to bias test results is very low.

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Forensic Evidence

- ❑ Nuclear DNA testing and bias

But, if DNA evidence is ambiguous or complex, such as when it involves multiple sources, then contextual information can bias results.

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Forensic Evidence

- ❑ DNA mixture from real criminal case.
- ❑ Gang rape, with semen obtained.
- ❑ Original DNA forensic experts told that one assailant testified against other suspects in return for a lesser sentence (plea deal). These other assailants denied any involvement in the rape.

Deor & Hampikian (2011)

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Forensic Evidence

- ❑ The DNA mixture was examined by the experts.
- ❑ The experts all concluded that the suspects implicated by the assailant could not be excluded as contributors.

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Forensic Evidence

Procedures:

- ❑ 17 DNA experts evaluated DNA of one suspect from the original criminal case.
- ❑ The 17 experts were not told that the suspects had been implicated in the crime.

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Forensic Evidence

Procedures:

- 17 DNA experts were given the following:
- DNA mixture from rape kit.
 - DNA from three suspects, one of whom the original experts said “could not be excluded” as a source. Others were fillers.

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Forensic Evidence

Procedures:

Original DNA experts:

Told that assailant had testified against other suspects whose DNA they were evaluating.

17 new DNA experts:

Not provided with this potentially biasing information.

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Forensic Evidence

Procedures:

Each expert independently evaluated the DNA and gave one of three conclusions:

1. Cannot be excluded.
2. Inconclusive.
3. Excluded.

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Forensic Evidence

Results:

	Cannot be Excluded	Inconclusive	Excluded
Original DNA Experts (biased group)	100%	0%	0%
17 New DNA Experts (unbiased group)	1 (~ 6%)	4 (~ 24%)	12 (~ 71%)

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Forensic Evidence

☐ Summary of Problems:

1. With the exception of DNA, little to no research has examined the accuracy of forensic testing.

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Forensic Evidence

☐ Summary of Problems:

2. Research that has been done shows that forensic evaluations are influenced by contextual information, even DNA.

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Forensic Evidence

☐ Summary of Problems:

3. Some forensic analysts are frauds who make up test results and present them as if they are true and infallible.

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Forensic Evidence

☐ Summary of Problems:

4. Current practices do not have a feedback system that can correct overconfidence in the probative value of forensic testing.

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Forensic Evidence

❑ So, what is the solution?

Many favor proficiency testing as a safeguard against unreliable forensic techniques.

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Forensic Evidence

❑ Proficiency Testing:

A spot check.

Determines the accuracy of individual laboratories, and individual analysts.

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Forensic Evidence

❑ Proficiency Testing:

An analyst evaluates whether two samples match.

Because the truth of the match is known (match/no match), the analyst's accuracy can be assessed.

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Forensic Evidence

❑ Proficiency Testing:

Better than no safeguard, but the samples are of unknown representativeness.

If the samples are obviously different, an accurate evaluation will be easy and provide little information about the analyst's or the technique's validity.

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Forensic Evidence

❑ Proficiency Testing:

Sometimes the analyst knows that the task is part of a proficiency test (not blind).

In such cases, the analyst may try extra hard to make a correct evaluation, leading to greater accuracy than is typical for that analyst.

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Forensic Evidence

❑ But, there is a better way...

The Filler-Control Method.

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Forensic Evidence

❑ Filler-Control Method:

A standard practice in forensic testing is to provide the analyst with two samples.

Suspect
Sample

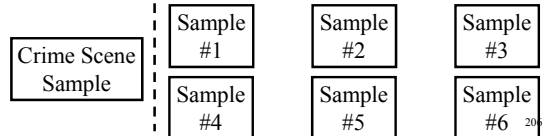
Crime Scene
Sample

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Forensic Evidence

❑ Filler-Control Method:

Filler-Control Method presents analyst with a different task, involving matched samples.



Forensic Evidence

❑ Filler-Control Method:

The analysts must perform the test and write the report without any prior knowledge of which sample was from the suspect and which were fillers.

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Forensic Evidence

❑ Filler-Control Method:

Every time an analyst picks a filler, s/he has failed because that sample does not match.

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Forensic Evidence

❑ Filler-Control Method:

Over a series of tests, unreliable techniques and incompetent or fraudulent analysts would quickly be identified.

Reliable techniques and competent analysts would also be quickly identified.

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