Overview of Estimator and System Variables in Eyewitness Identification

Presented at National Academy of Sciences
Washington, DC
December 2013
Gary L. Wells
Iowa State University
The Controlled Lab Method for the Scientific Study of Eyewitness Identification
Created event
Created event

N# witnesses

View a lineup
Created event

N# witnesses

View a lineup
Created event

- Nature of the witnessed event
- N# witnesses
- View a lineup
- Identification decision
- Certainty of identification
Created event

N# witnesses

Characteristics of witnesses

View a lineup

Identification decision

Certainty of identification
Instructions

View a lineup

Identification decision

Certainty of identification

Created event

N# witnesses
N# witnesses

View a lineup

Type of lineup

Identification decision

Certainty of identification

Created event
Created event

N# witnesses

View a lineup

Identification decision

Certainty of identification

Behaviors of lineup administrator
System vs. Estimator distinction (Wells, 1978)

**Estimator variables**: Variables that affect the accuracy of eyewitness identification over which the justice system has no control (but might be used to estimate accuracy).

- **View** (duration, lighting, distance, obstructions, disguises);
- **Attention** (distractions, weapons);
- **Stress** & fear;
- **Race/ethnicity congruence**;
- **Retention** interval;
- **Interactions** among witnesses

**System variables**: Variables that affect the accuracy of eyewitness identification over which the justice system has control.

- **Show-up** vs. lineup;
- **Initial interviews**;
- **Pre-lineup instructions**;
- **Filler** selection;
- **Suggestive** lineup-administrator behaviors;
- **Post-ID reinforcement/feedback**;
- **Repeated** ID procedures (same suspect w/new fillers);
- **Base rate** for culprit presence

Note: All system variables can also be used as estimator variables, but not vice versa.
Some Estimator Variables

- Disguise
- Distance
- Stress/fear
- Weapons and other distractions
- Race/ethnicity
- Retention interval
- Appearance change
- Witness age (& witness/perpetrator age similarity)
- Co-witness contamination
Some System Variables

- Lineups versus show-ups (show-ups suggestive and fail to distribute errors to less the harmful category of filler identifications)
- Pre-identification instructions (to warn that culprit might not be present and legitimize a non-identification response)
- Simultaneous versus sequential presentation (to improve proportion of accurate identifications among those making identification)
- Filler selection methods (to not let suspect stand out)
- Double-blind lineup administration (to prevent inadvertent verbal/non-verbal suggestion)
- Repeated identification procedures (e.g. showing suspect again with different fillers)
- Collecting a certainty statement at the time of identification (by blind administrator prior to confidence-inflating feedback)
- Base rate for culprit presence (because harmful mis-identifications occur when culprit not present in lineup/show-up)
- Contemporaneous and complete records (e.g., to make sure non-IDs and filler IDs are part of the record)
A fairly large portion of the system variables can be (and have been) derived from the lineups-as-scientific-experiments analogy (Wells & Luus, 1990)
Police Lineups as Experiments Analogy
(Wells & Luus, 1990)

Police conducting a lineup can be likened to scientists conducting an experiment:

<table>
<thead>
<tr>
<th>Experiment term</th>
<th>Lineup counterpart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis</td>
<td>This suspect is the culprit</td>
</tr>
<tr>
<td>Null hypothesis</td>
<td>This suspect is not the culprit</td>
</tr>
<tr>
<td>Experimenter</td>
<td>Lineup administrator</td>
</tr>
<tr>
<td>Subjects</td>
<td>Eyewitness(es)</td>
</tr>
<tr>
<td>Stimulus</td>
<td>Suspect or his/her photo</td>
</tr>
<tr>
<td>Materials</td>
<td>The suspect and similar-looking known-innocent fillers</td>
</tr>
<tr>
<td>Design</td>
<td>e.g., embed suspect among fillers; assign position; # fillers; criteria for fillers</td>
</tr>
<tr>
<td>Procedure</td>
<td>e.g., Pre-lineup instructions, double versus single blind</td>
</tr>
<tr>
<td>Dependent measures</td>
<td>Identification decision, certainty</td>
</tr>
<tr>
<td>Outcome scoring/ records</td>
<td>ID suspect, ID filler, reject, “don't know”</td>
</tr>
<tr>
<td>Interpretation</td>
<td>Increase or decrease belief in the hypothesis</td>
</tr>
</tbody>
</table>
Things that can go wrong with a scientific experiment can (and do) go wrong with lineups

<table>
<thead>
<tr>
<th>Experiment Flaw Terms</th>
<th>Lineup counterpart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-session contamination</td>
<td>e.g., “We got the guy – we need you to ID him” or prior exposure to suspect’s image</td>
</tr>
<tr>
<td>Absence of a control condition</td>
<td>e.g., no test of “mock witnesses”</td>
</tr>
<tr>
<td>Violations of protocol</td>
<td>e.g., No pre-lineup instructions or cursory/incredulous delivery</td>
</tr>
<tr>
<td>Leaking of hypothesis/Demand</td>
<td>e.g., suspect stands out</td>
</tr>
<tr>
<td>Experimenter expectancy/tester influence</td>
<td>e.g., non-blind administration, suggestive comments, non-verbal cueing</td>
</tr>
<tr>
<td>Selective/incomplete records of outcomes</td>
<td>e.g., no record when witness does not ID suspect; failure to document filler IDs, or “could not ID suspect” versus rejected all</td>
</tr>
<tr>
<td>Debriefing participant before all important measures collected</td>
<td>e.g., Post-identification feedback before securing certainty statement</td>
</tr>
<tr>
<td>Failure to objectively interpret outcome/ confirmation bias</td>
<td>e.g., Dismissing rejecters as poor witnesses; using only confirming witnesses</td>
</tr>
</tbody>
</table>
System Variables are not Restricted to Memory

System variables are any variables that increase or decrease the chances of mistaken identification over which the justice system has control. [Hence, for example, they include social influence, counting rules, and base rates.]

E.g., a “counting rule” – the single-suspect versus all-suspect lineup

A proper identification procedure is on in which there is only one suspect and the remaining are known-innocent fillers. Lineups in which all members are suspects greatly inflate the rate at which innocent suspects are identified (Wells & Turtle, 1986, Psychological Bulletin).

An all-suspect lineup is like a multiple-choice test in which there are no wrong answers.
System Variables are not Restricted to Memory

*Base rate* (prior probability): The proportion of lineups conducted in which the suspect is the actual perpetrator.

Bayesian analyses of this lineup base-rate problem date back more than 30 years (Wells & Lindsay, 1980, *Psychological Bulletin*).

The base-rate for the lineup including the culprit is not *per se* a memory variable.

**Assuming the single-suspect model:**
Mistaken identifications of an innocent suspect cannot occur if the culprit is in the lineup. Identifications of an innocent suspect occur only if the culprit is absent.

Note: In every DNA exoneration case, the actual perpetrator was not present in the identification procedure.
The Base Rate as a System Variable

There is no legal requirement or standard that needs to be met to place a person in an identification procedure (Wells, *Wisconsin Law Review*, 2006).

Hence, potential suspects are commonly exposed to the jeopardy of identification tasks based on mere hunches, guesses, someone fitting the general description, and “trawling” procedures.

Proposed system reform: A detective must articulate and document reasonable suspicion (e.g., to a supervisor of detectives) before placing a potential suspect into the inherent jeopardy of a lineup.

Note: Bayesian analyses show that even modest elevations in base rate (e.g., from 40% to 60%) produce greater increases in accurate identifications and suppression of mistaken identifications than any other system variable.
Methods

Lab experiments
  Cause-effect relations

DNA and other exon cases
  Limited scientific utility (case studies; albeit a large set)
  However, strong elements of real-world corroboration:
  – high false certainty
  – biased lineups
  – reinforcement/feedback/certainty-inflation
  – suggestive administrator behaviors
  – persuasiveness to juries
  – failures of Manson-type safeguards
  – failures to make records of prior identification attempts

Field studies (overlooked and underappreciated)
  Estimates of how often witnesses identify known-innocent fillers in actual cases involving serious crimes
# Field Studies of Actual Eyewitnesses

<table>
<thead>
<tr>
<th>STUDY</th>
<th>% of IDs that are of a known-innocent filler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behrman &amp; Davey (2001)</td>
<td>32%</td>
</tr>
<tr>
<td>Behrman &amp; Richards (2005)</td>
<td>22%</td>
</tr>
<tr>
<td>Horry et al (2012)</td>
<td>40%</td>
</tr>
<tr>
<td>Horry et al (in press)</td>
<td>28%</td>
</tr>
<tr>
<td>Klobuchar et al, 2006</td>
<td>24%</td>
</tr>
<tr>
<td>Memon et al (2011)</td>
<td>49%</td>
</tr>
<tr>
<td>Slater (1994)</td>
<td>38%</td>
</tr>
<tr>
<td>Valentine et al (2003)</td>
<td>34%</td>
</tr>
<tr>
<td>Wells, Steblay, Dysart (2011)</td>
<td>36%</td>
</tr>
<tr>
<td>Wright &amp; McDaid (1996)</td>
<td>34%</td>
</tr>
<tr>
<td>Wright &amp; Skagerberg (2007)</td>
<td>27%</td>
</tr>
<tr>
<td><strong>AVERAGE for all 11</strong></td>
<td><strong>33%</strong></td>
</tr>
</tbody>
</table>

Note: Overall, 64% of witnesses made an identification, (21% filler & 43% suspect)

Questions and Discussion