

Table 1

*Lineup performance: Sequential vs. Simultaneous Lineup Formats**2008 data (2001 meta-analysis data in parentheses)*

	<i>n</i>	<u>Sequential</u>	<u>Simultaneous</u>	<i>r</i>	<i>Z_{ma}</i>
Eyewitness decisions		%	%		
		2008 (2001)	2008 (2001)		
<u>Culprit-present lineup</u>					
Culprit ID	56	.38 (.35)	.52 (.50)	-.14	-9.03*
Filler	45	.25 (.19)	.25 (.24)		
No choice	45	.40 (.46)	.26 (.26)		
<u>Culprit-absent lineup</u>					
Correct rejection	62	.64 (.72)	.43 (.49)	.22	15.56*
Filler	62	.36 (.28)	.57 (.51)		
<u>Identification of</u>					
<u>designated innocent</u>					
suspect	26	.12 (.09)	.23 (.27)	.14	6.56*

Table 2

*Lineup Performance: Sequential vs. Simultaneous Lineup Formats**Diagnostic subset of 2x2 designs, published, adult witnesses*

	<i>n</i>	<u>Sequential</u>	<u>Simultaneous</u>	<i>r</i>	<i>Zma</i>
Eyewitness decision		%	%		
<hr/>					
<u>Culprit-present lineup</u>					
Culprit ID	26	.45	.53	-.09	-4.02*
Filler	22	.20	.26		
No choice	22	.39	.23		
<u>Culprit-absent lineup</u>					
Correct rejection	26	.65	.43	.23	9.22*
Filler	26	.35	.57		
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Identification of					
designated innocent					
suspect	10	.15	.25	.14	4.18*

Table 2 (continued)

Data set for 10 tests that include a designated innocent suspect in culprit-absent lineup

			<u>Sequential</u>	<u>Simultaneous</u>	<u>r</u>	<u>Z_{ma}</u>
<u>Culprit-present lineup</u>						
Culprit ID	10	.50	.52		-.03	.96
Filler		.20	.22			
No choice		.31	.26			
<u>Culprit-absent lineup</u>						
Correct rejection	10	.59	.43		.17 *	5.58*
Filler		.41	.57			

Data set for 16 tests that did not include a designated innocent suspect

			<u>Sequential</u>	<u>Simultaneous</u>	<u>r</u>	<u>Z_{ma}</u>
<u>Culprit-present lineup</u>						
Culprit ID	16	.41	.54		-.14	-5.04 *
Filler	12	.20	.22			
No choice	12	.31	.26			
<u>Culprit-absent lineup</u>						
Correct rejection	16	.69	.43		.26	7.34 *
Filler	16	.31	.57			

Table 3

Moderator Variable Analyses

	Culprit-present	Culprit-Absent	Innocent
	Correct IDs	Correct rejections	suspect
	<i>r</i> (<i>n</i>)	<i>r</i> (<i>n</i>)	<i>r</i> (<i>n</i>)
<u>Diagnostic dataset (<i>Adult witnesses, published, 2x2 design</i>)</u>			
Diagnostic	-.09 (26) *	.23 (26) *	.14 (10) *
Remaining tests	-.19 (30) *	.21 (36) *	.14 (16) *
<u>Robustness of the sequential superiority effect</u>			
<u>Witness age</u>			
Adults	-.13 (46) *	.24 (54) *	.15 (24) *
Older adults	-.25 (5) *	.27 (4) *	---
Age 12-18	-.11 (1)	-.14 (1)	---
Children under 12	-.19 (4) *	.00 (3) <i>ns</i>	.03 (2)
<i>Note: Subsequent tests use only the "adult" witness category:</i>			
<u>Lindsay lab</u>			
Lindsay	-.13 (16) *	.26 (21) *	.24 (14) *
Others	-.13 (30) *	.22 (33) *	.01 (10) <i>ns</i>
<u>Publication status</u>			
Published	-.11 (30) *	.26 (38) *	.16 (16) *
Unpublished	-.17 (16) *	.17 (16) *	.12 (8) *

Note: Unless noted otherwise, subsequent analyses use the diagnostic dataset: published tests, adult eyewitnesses, a full 2X2 research design.

Lineup construction method

Match to description	-.10 (13) *	.25 (13) *	.17 (7) *
Match to culprit	-.08 (10) *	.21 (10) *	.06 (3) <i>ns</i>
No report	-.10 (3) <i>ns</i>	.21 (3) *	---

Lineup fairness check

Ranked visual similarity	-.04 (7) <i>ns</i>	.17 (7) *	.10 (3) <i>ns</i>
Mock witness procedure	-.15 (2) *	.26 (2) *	---
Functional/Effective size	-.09 (5) *	.16 (5) *	.09 (5) *
Unreported	-.10 (11) *	.27 (11) *	.30 (2) *

Culprit-replacement similarity (in culprit-absent lineups)

High	-.04 (6) <i>ns</i>	.20 (6) *	.12 (5) *
Moderate /similar	-.12 (11) *	.15 (11) *	.11 (4) *
Unreported	-.10 (9) *	.35 (9) *	.29 (1) *

Selection method for culprit replacement (in culprit-absent lineups)

Highest sim to culprit	-.09 (5) *	.18 (5) *	.12 (4) *
Similar-looking	-.09 (8) *	.28 (8) *	.19 (3) *
Next best alternative	+.14 (2)	.02 (2)	.01 (2) <i>ns</i>
Unreported	-.08 (4) <i>ns</i>	.29 (4) *	.29 (1) *

Appearance Change

Change reported	-.13 (2)	.44 (2) *	---
Unreported	-.09 (23) *	.22 (23) *	.14 (9) *

Stimulus Mode

Live	-.08 (7) *	.23 (7) *	.20 (5) *
Video	-.10 (18) *	.23 (18) *	.05 (4) ns
From the larger dataset:			
Slides	-.29 (3) *	.26 (2) *	.18 (2) *

Crime type

Theft	-.10 (11) *	.25 (11) *	.18 (7) *
Mugging	-.07 (5) ns	.17 (5) *	---
Break-in	-.17 (2)	.27 (2) *	---
Car-jacking	-.05 (3) ns	.08 (3) *	.04 (3) ns
Suspicious behavior	+.11 (1)	.41 (1) *	---
Erratic driving/police stop	-.15 (1)	.78 (1) *	
Ventilation shaft bomber	-.31 (1) *	.02 (1)	---
No crime	-.11 (2) ns	.15 (2) *	---

Lineups per witness

Single lineup	-.08 (23) *	.23 (23) *	.14 (10) *
2 perps, 2 lineups	-.17 (3) *	.19 (3) *	---

Exposure to perpetrator

< 10 seconds	-.11 (2) *	.15 (2) *	.09 (1)
10-20 seconds	-.15 (9) *	.17 (9) *	.18 (3)
60-75 seconds	-.07 (4) *	.25 (4) *	---
4.75 minutes	-.15 (1)	.78 (1) *	---
Unreported (10)	-.05 (10) ns	.24 (10) *	.12 (6) *

Length of crime scenario

<31 seconds	-.12 (2) *	.16 (2) *	-.11 (2) ns
31-60 seconds	-.13 (7) *	.22 (7) *	---
75-90 seconds	-.11 (5)	.22 (5)	.16 (1)
2-3 minutes	-.21 (3) *	.19 (3) *	---
5-6 minutes	-.10 (2)	.55 (2) *	---
Unreported (7)	-.01 (7) ns	.19 (7) *	.14 (7) *

Delay

30 minutes or less	-.08 (22) *	.22 (22) *	.14 (10) *
1 hour	-.32 (1) *	.46 (1) *	---
>24 hours	-.13 (3) *	.24 (3) *	---

Intentional learning

Not told ahead	-.07 (13) *	.25 (13) *	.17 (7) *
Unreported	-.10 (12) *	.23 (12) *	.06 (3) ns
From the larger dataset:			
told ahead	-.19 (4) *	.31 (4) *	-.05 (1)

Operational specifics of the sequential lineup procedureLineup size

6	-.12 (21) *	.23 (21) *	.11 (5) *
6/5	+.14 (2) *	.02 (2)	.01 (2)
8	-.03 (3)	.33 (3) *	.26 (3) *

Cautionary Instruction (“may or may not...”)

Unbiased instruction	-.10 (20) *	.23 (20) *	.10 (7) *
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Option to either choose or			
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reject the lineup	-.11 (1)	.41 (1) *	---
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Position of suspect

Full rotation	-.15 (8) *	.22 (8) *	.13 (2) *
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Partial rotation	-.02 (5) ns	.23 (5) *	.06 (4) ns
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Stable in position (3+)	-.12 (5) *	.25 (5) *	.15 (2) *
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Unreported	-.07 (8) *	.22 (8) *	.28 (2) *
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Photo order counterbalanced/randomized

Counterbalanced	-.09 (10) *	.23 (10) *	.04 (5) ns
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None or constant	-.15 (6) *	.20 (6) *	.19 (2) *
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Unreported	-.06 (10) ns	.25 (10) *	.26 (3) *
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Description of perpetrator before ID

Yes	-.04 (13) ns	.19 (13) *	.15 (7) *
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Unreported/no	-.15 (13) *	.32 (13) *	.11 (3) *
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Backloading of sequential lineup

Backloaded	-.10 (21) *	.25 (21) *	.14 (8) *
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Not backloaded	.01 (4) ns	.13 (4) *	.12 (2)
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Unreported (1)			
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Preview of number of photos

Series of photos	-.18 (8) *	.25 (8) *	.30 (1) *
Specific number	-.06 (2) ns	.16 (2) *	-.08 (1)
No preview	-.03 (10) ns	.20 (10) *	.13 (7) *
Not informed, extra spaces	-.12 (5) *	.30 (5) *	.22 (1) *
Unreported (1)			

Instructed response options for sequential lineup

Instructions: yes/no	-.18 (10) *	.19 (10) *	.01 (2) ns
Yes/No printed options	-.04 (15) ns	.26 (15) *	.18 (7) *
Unreported (1)			

Instruction regarding post-ID procedure

No further photos after ID	-.18 (5) *	.22 (5) *	---
Each will be presented/end	-.09 (8) *	.17 (8) *	.13 (4) *
Unreported	-.06 (12) *	.28 (12) *	.15 (5) *

Stopping rule

Stop at ID	-.19 (7) *	.24 (7) *	---
Continue to end of lineup	-.05 (18) *	.19 (18) *	.14 (9) *
Unreported (1)			

Treatment of multiple IDs (for studies that continue the lineup)

Count as filler ID	-.12 (3) *	.20 (3) *	.26 (2) *
1 st response rule	.00 (8) ns	.15 (8) *	.01 (4) ns
None made multiple IDs	-.15 (2)	.26 (2) *	
Unreported (5)			

Blind Administration (Experimenter expectancy effects)

Full blind reported	.04 (3) <i>ns</i>	.27 (3) *	.01 (2) <i>ns</i>
Multiple measures	-.12 (16) *	.22 (16) *	.10 (3) *
Not blind	-.09 (5) *	.22 (5) *	.24 (4) *
Unreported (1)			

Blind instruction (“I don’t know who the suspect is”)

From full dataset:

Blind instruction – yes	-.02 (2)	.19 (2) *	---
No blind instruction	-.08 (5) *	.17 (6) *	.00 (2) <i>ns</i>
Unreported	-.14 (39) *	.25 (46) *	.16 (22) *

* the difference between simultaneous and sequential lineups is statistically significant, with $p < .05$

ns = a not-significant finding, but also one in which obtained effect sizes are on both sides of zero; i.e., a “zero” effect hides findings in which each of sequential and simultaneous lineups are at times favored.

Not included in the listing are “mixed conditions” (in which participants within the same study experienced different levels of the variable) and unreported cases or other tested conditions in which the number of tests was very small (typically, 1).

Table 4

Diagnosticity Ratios for System Variables in Sequential and Simultaneous Lineups

Eyewitness decisions (percentages)*

System Variable	Sequential Lineup	Simultaneous Lineup
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Lineup construction method

Match to description

CP Correct ID	.48	.58
CP Filler	.13	.20
CA Filler	.29	.53
Diag	10.00	6.59

Match to culprit

CP Correct ID	.38	.45
CP Filler	.29	.35
CA Filler	.46	.66
Diag	4.94	4.09

Selection Method for the Innocent Suspect

(innocent suspect value in parentheses)

Highest Similarity Culprit

CP Correct ID	.49	.58
CP Filler	.15	.16

CA Filler (IS)	.38 (.095)	.55 (.188)
Diag (IS)	7.78 (5.16)	6.30 (3.09)

Similar-looking

CP Correct ID	.38	.46
CP Filler	.24	.27
CA Filler/IS	.29 (.127)	.56 (.260)
Diag (IS)	7.92 (2.99)	4.95 (1.77)

Next best alternative

CP Correct ID	.47	.34
CP Filler	.37	.49
CA Filler/IS	.68 (.355)	.70 (.365)
Diag (IS)	4.16 (1.32)	2.91 (.93)

Culprit position

Full rotation

CP Correct ID	.39	.53
CP Filler	.18	.22
CA Filler	.33	.55
Diag	7.09	5.76

Partial rotation

CP Correct ID	.43	.44
CP Filler	.20	.36
CA Filler	.42	.64
Diag	6.14	4.11

Stable in position 3+

CP Correct ID	.40	.51
CP Filler	.25	.27
CA Filler	.36	.60
Diag	6.67	5.1

Cautionary Instruction

Cautionary instruction

CP Correct ID	.39	.49
CP Filler	.20	.28
CA Filler	.33	.55
Diag	7.09	5.44

Backloading

Backloaded/participants not aware

CP Correct ID	.42	.52
CP Filler	.19	.27
CA Filler	.34	.58
Diag	7.37	5.36

Not backloaded

CP Correct ID	.58	.57
CP Filler	.29	.23
CA Filler	.41	.51
Diag	8.53	6.71

Preview for number of photos

Series

CP Correct ID	.38	.54
CP Filler	.13	.28
CA Filler	.36	.60
Diag	6.33	5.40

No preview

CP Correct ID	.50	.54
CP Filler	.21	.23
CA Filler	.40	.59
Diag	7.46	5.51

Extra spaces

CP Correct ID	.30	.41
CP Filler	.30	.34
CA Filler	.31	.61
Diag	5.77	4.02

Instructed response options

Instruction: yes/no

CP Correct ID	.34	.52
CP Filler	.20	.25
CA Filler	.30	.49
Diag	7.00	6.34

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4 Yes/no response options
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6 CP Correct ID	.50	.54
7 CP Filler	.18	.27
8 CA Filler	.35	.60
9 Diag	8.62	5.40

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16 Instruction regarding lineup completion
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18 No further photos after ID
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20 CP Correct ID	.47	.64
21 CP Filler	.13	.28
22 CA Filler	.35	.56
23 Diag	8.10	6.88

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31 Each presented/end
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33 CP Correct ID	.40	.51
34 CP Filler	.21	.20
35 CA Filler	.32	.50
36 Diag	8.11	6.50

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43 Stopping rule
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45 Stop at ID
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47 CP Correct ID	.48	.66
48 CP Filler	.15	.23
49 CA Filler	.41	.64
50 Diag	7.06	6.17

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Continue to end

CP Correct ID	.45	.50
CP Filler	.22	.25
CA Filler	.33	.52
Diag	8.18	5.75

Treatment of multiple IDs

Count as error

CP Correct ID	.38	.49
CP Filler	.18	.21
CA Filler	.35	.55
Diag	6.55	5.33

1st response rule

CP Correct ID	.51	.51
CP Filler	.21	.31
CA Filler	.38	.52
Diag	8.10	5.86

Control of Experimenter Effects

Full blind

CP Correct ID	.36	.31
CP Filler	.33	.54
CA Filler	.54	.80
Diag	4.00	2.33

Not blind

CP Correct ID	.53	.61
CP Filler	.21	.17
CA Filler	.37	.57
Diag	8.55	6.42

Multiple measures

CP Correct ID	.42	.54
CP Filler	.17	.24
CA Filler	.29	.50
Diag	8.75	6.51

*Correct identification percentage in Culprit-present lineup (CP Correct ID); Filler pick percentage in culprit-present lineup (CP Filler); Filler pick percentage in culprit-absent lineup (CA filler); and diagnosticity (Diag).

Diagnostic calculations are a ratio of culprit-present correct identifications to culprit-absent filler identifications. Filler IDs are divided by six, to estimate the risk of misidentification to any single lineup member. Five of the lineups were not of size six; when adjusted for lineup size, the reported numbers change very little.

Figure 1. Culprit present lineups: Stem and leaf of effect sizes (r), N = 56 tests

(Diagnostic data set in **bold**)

<u>Stem</u>	<u>Leaf</u>
.8	
.7	
.6	
.5	
.4	
.3	
.2	1
.1	1
.0	0,0,0,5,5,6,7
-.0	3,4,4,5,6,6,6,8,8,8,8,8,9,9,9
-.1	0,0,0,1,1,1,3,5,6,8,9
-.2	0,0,1,2,2,4,6,8,9,9,9
-.3	0,0,0,1,2,2,4,5
-.4	3,7
-.5	
-.6	
-.7	
-.8	

Figure 2. Culprit absent lineups: Stem and leaf display of effect sizes (r), $N = 62$ tests

(Diagnostic data set in **bold**)

.8	
.7	8
.6	1
.5	4,7
.4	1,1,2,3,3,6,6,6,7
.3	0,0,2,3,3,4,6,6,6
.2	0,0,1,2,2,3,3,3,9,9,9
.1	0,0,0,1,2,6,7,9
.0	0,2,2,2,2,2,4,4,8,8,8,9,9,9,9
-.0	4,5,5,7
-.1	4
-.2	
-.3	
-.4	
-.5	
-.6	
-.7	
-.8	

Appendix A

Studies in the Meta-Analytic Calculations (70 tests)

			Culprit Present	Culprit Absent					
			<u>r</u>	<u>r</u>	<u>Inno</u>	<u>Diag</u>	<u>Adult</u>	<u>LL</u>	<u>Pub</u>
14	Beaudry Mansour Bertrand Lindsay	2006	-.06	.04			A	L	
16	Blank & Krahe	2000	-.43				A		
19	Carlson Gronlund & Clark	2008	-.16	.09	I	D	A		P
21	(2)		-.11	.20	I	D	A		P
24	Clark & Davey	2005	.21	.02	I	D	A		P
26	(2)		.06	.02	I	D	A		P
29	Cutler & Penrod	1988	.05	.23		D	A		P
31	(2)		-.06	.22		D	A		P
34	Dormer	1983	-.08	.16	I		A	L	
36	Douglass & McQuiston-Surrett	2006		.21			A		P
38	(2)		-.31	.02		D	A		P
41	Dysart	1999	-.04	.10			A	L	
43	Dysart & Lindsay	2001		.41			A	L	P
46	Ferch & Ebbesen	2003	-.29	.22			A		
48	(2)		-.47	.30	I		A		
51	Gaitens et al.	2002		.17	I		A		
53	Greathouse & Kovera	(in press)	.00	.08	I	D	A		P
55	Hannaford	1985	-.21	.02	I		A	L	
58	Jacob	1994	-.09	.00	I		A	L	

1								
2								
3								
4	Varrette	1994	-.08	.47	I		A	L
5								
6	Wells & Pozzulo	2006	-.19	.02		D	A	P
7								
8								
9	Wilcock Bull & Vrij	2005	-.03	.46		D	A	P
10								
11	(2)		-.35	.08			O	P
12								
13								
14	Yarmey & Morris	1998		.29	I		A	P
15								
16			56	62	26	26		27 51
17								
18								
19								
20								

21 Culprit-Present r: Effect size for correct identifications

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23 Culprit-Absent r: Effect size for correct rejections

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26 Inno: tests that include a designated innocent suspect (26)

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29 Diag: the Diagnostic Dataset—published tests, adult witnesses, 2 X 2 design (26).

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31 Adult: age category of the witness-participants (Age: A = Adult; O = Older adult; C =

32 Children under 12; T = teen)

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35 LL: tests from the Lindsay lab (26)

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37 Pub: Published tests (51)

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Appendix B

Study Features of the Diagnostic Dataset (26 tests)

			Lineup		Perp			Photo	Back-
			Const	Fair	Position	ExpE	Stop	Order	loaded
14	Carlson Gronlund & Clark	2008	Desc	size	Full	Multi	End	Bal	Back
16	(2)		Desc	size	Part	Multi	End	Bal	Back
19	Clark & Davey	2005	Culp	visual	Part	Blind	End	Bal	Back
21	(2)		Culp	visual	Part	Blind	End	Bal	Back
24	Cutler & Penrod	1988	--	--	--	Multi	End	--	Back
26	(2)		--	--	--	Multi	End	--	No
29	Douglass, McQuiston-Surrett	2006	Culp	--	--	Mixed	Stop	No	Back
31	Greathouse & Kovera	(in press)	Desc	Size	Fixed	Mixed	Stop	No	No
34	Kneller et al.	2001	Culp	Visual	Full	--	Stop	--	Back
36	Levi	2006	--	--	--	Multi	Stop	Bal	--
38	Lindsay Lea & Fulford	1991	Desc	Size	Fixed	Mixed	End	--	Back
41	Lindsay et al.	1991	Desc	Visual	--	Mixed	End	--	Back
43	(2)		Desc	--	--	Mixed	End	--	Back
46	Lindsay et al.	1997	Desc	--	--	Multi	End	--	Back
48	Lindsay & Wells	1985	Desc	--	Part	Multi	End	No	Back
51	MacLin et al.	2005	Desc	Mock	--	Multi	End	--	Back
53	(2)		Desc	Mock	--	Multi	End	--	Back
56	Melara et al.	1989	Culp	--	Part	Blind	--	Bal	Back
58	Memon & Gabbert	2003b	Desc	--	Fixed	Multi	Stop	No	Back

Parker & Ryan	1993	Culp	Size	Full	Mixed	End	Bal	No
Pozzulo et al.	(in press)	Culp	--	Fixed	Multi	End	No	Back
Pozzulo & Marciniak	2006	Culp	--	Fixed	Multi	End	No	Back
Rose Bull & Vrij	2005	Desc	Visual	Full	Multi	Stop	Bal	Back
Sporer	1993	Culp	Visual	Full	Multi	End	Bal	Back
Wells & Pozzulo	2006	Culp	Visual	Full	Multi	End	--	Back
Wilcock Bull & Vrij	2005	Desc	--	Full	Multi	Stop	Bal	Back

Lineup Const: Lineup construction method (Desc = Match to description; Culp = match to culprit)

Fair: Lineup fairness assessment (Size = functional or effective size calculated; Mock = mock witness method; Visual = lineup members checked for visual similarity)

Perp Position: Position of the culprit in the lineup (Full = full rotation through the lineup, except position 1; Part = partial rotation through 2-4 positions; Fixed = fixed in position)

ExpE: Control of experimenter expectancies (Multi = multiple methods; Blind = full blind; Mixed = not blind in at least half the conditions)

Stop: Stopping rule (End = continue to end of lineup; Stop = stop at an identification)

Photo Order: Lineup photos order (Bal = counterbalanced or randomized; No = no counterbalance)

Back: Backloading (Back = backloaded lineup, or subjects not aware of number of photos; No = no backload)