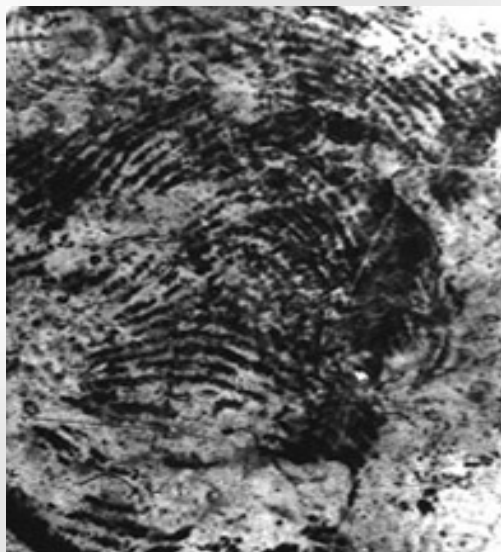
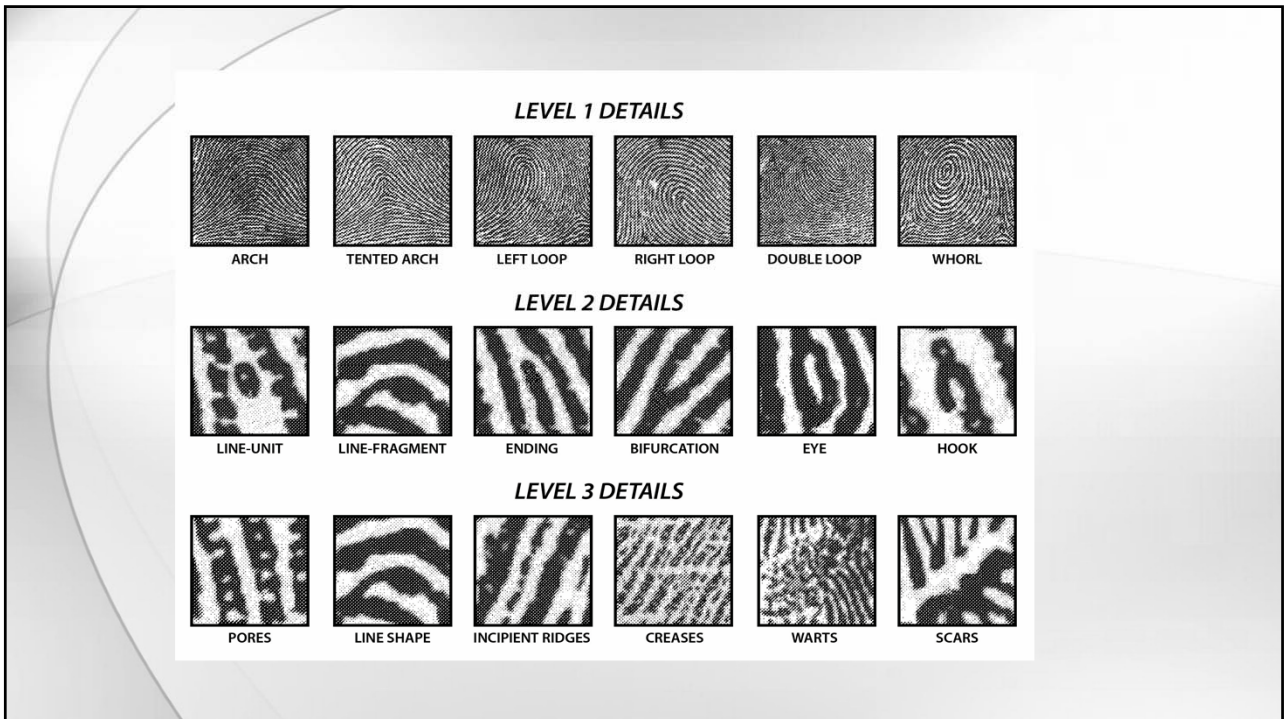
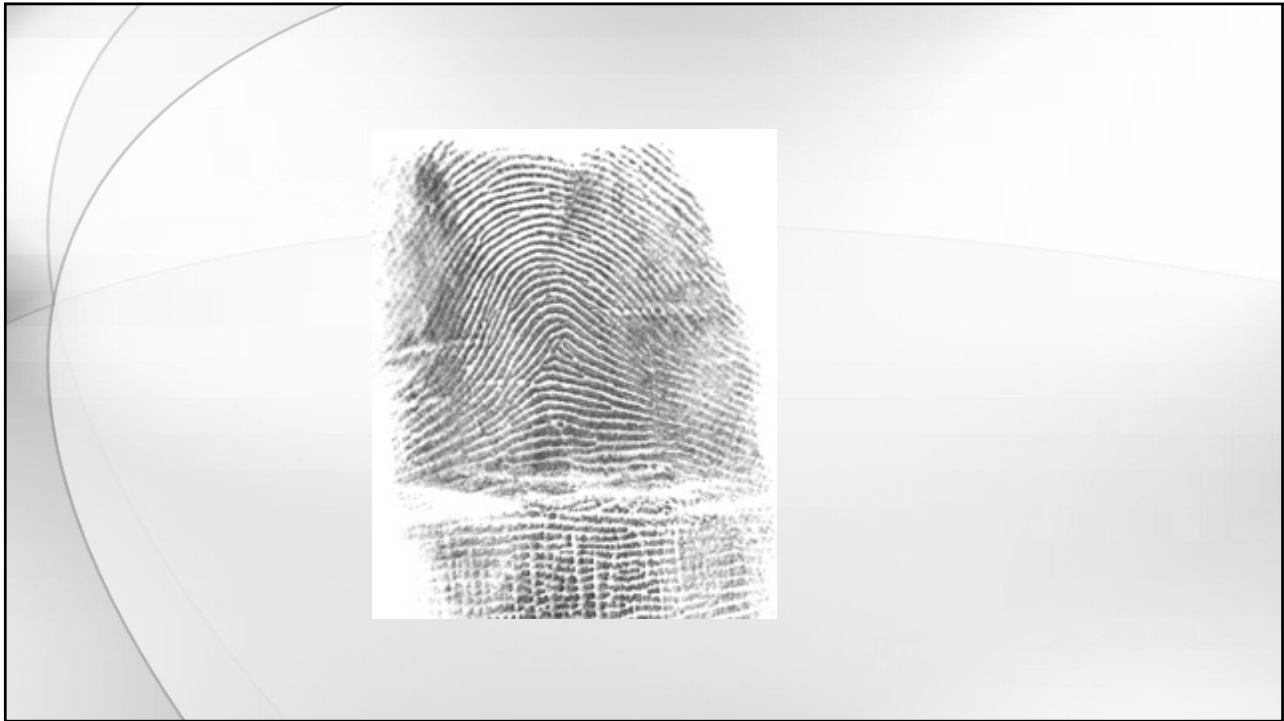


How Jurors Evaluate Fingerprint Evidence

Prof. Brandon Garrett
April 2, 2019
Duke University School of Law







MASTER		LEAVE THIS SPACE BLANK		DEAD	
Name	ALPHONSE CAPONE				
Alias	ALPHONSE CAPONE				
No.	5527	Color	WHITE	Sex	MALE
Ref. 1/11/101 10					
RIGHT HAND					
1. Thumb	2. Index Finger	3. Middle Finger	4. Ring Finger	5. Little Finger	
29	3	13	11	6	
4805	4805	4805	4805	4805	
LEFT HAND					
6. Thumb	7. Index Finger	8. Middle Finger	9. Ring Finger	10. Little Finger	
28	5	16	13	10	
4805	4805	4805	4805	4805	
Classified	Assembled	Note Amputations	Prisoner's Signature		
Searched	Verified		10 Alphonse Capone		
Index Card	Answered		Four Fingers Taken Simultaneously		
Left Hand		Right Hand			
26		4805			
Four Fingers Taken Simultaneously		Four Fingers Taken Simultaneously			

Stephan Cowans' Trial

Q And you look for points of identification that match up?

A Yes.

Q And how many total points of identification do you need to make a positive identification?

A Eight.

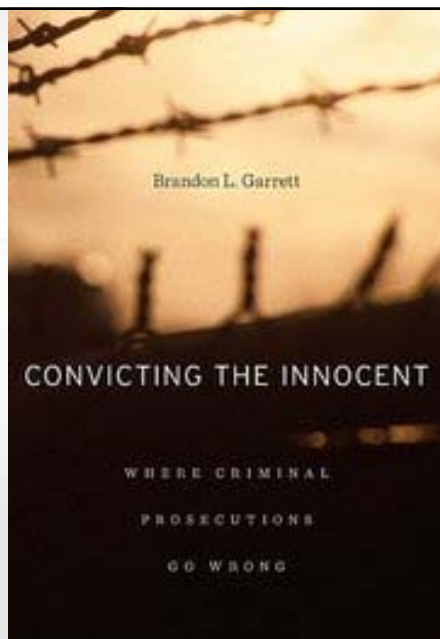


A That they were identical.

Q Whose print was it?

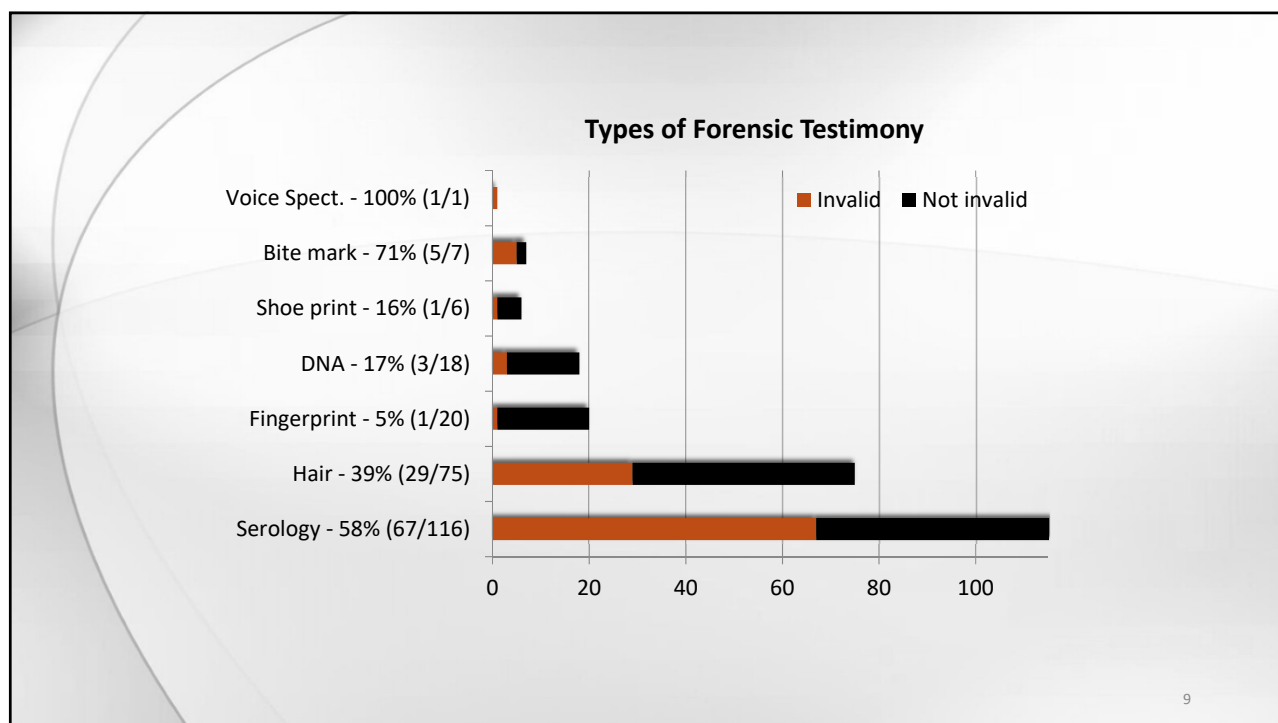
A Stephan Cowans'.


7



Data webpage
<http://www.convictingtheinnocent.com>

8





International Association for Identification (IAI) (2009)

- “It is suggested that members not assert 100% infallibility (zero error rate) when addressing the reliability of fingerprint comparisons.”
- “Members are advised to avoid stating their conclusions in absolute terms...”
 - Letter to all Members, Robert Garrett, IAI President, Feb. 19, 2009

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Prior work: *How Jurors Evaluate Fingerprint Evidence:* *The Relative Importance of Match Language, Method Information and Error Acknowledgement*

Brandon Garrett & Gregory Mitchell

10 JOURNAL OF EMPIRICAL LEGAL STUDIES 484 (2013)



Fingerprint evidence benefits from **common beliefs and background assumptions** in uniqueness and reliability of fingerprint identification

Language may not be important once jury is told a match was made (Match = Match to Exclusion of All Others = 100% Certain = Other Source a Practical Impossibility....)

Error statements by forensic experts should be given greater attention by courts and researchers

Variations in Testimony

- SWGFast language:
- The fingerprint found on the gun was individualized as the right thumb of the defendant. The likelihood the impressions were made by a different source is so remote that it is considered to be a practical impossibility."
- Bolstered match
 - "I concluded that the latent fingerprint found at the crime scene came from the same source as the left thumb print on the ink card labeled as taken from the defendant. The chance of having two individuals with the same fingerprint is one chance in 10 to the 86th power. That is more people and more fingers than are on our planet today."
- Simple match
 - "A latent fingerprint found at the scene was individualized as the left thumb of the defendant."

Acknowledging Error

- "Recent studies have found that fingerprint examiners do sometimes make mistakes about the source of a fingerprint found at a crime scene. It is possible that the defendant was not the source of the print found at the scene of this robbery."

Discounting Error

- "While there is always the possibility of human error in making an identification based on fingerprints, I have never made a mistake. The chances are infinitesimal that the pattern in the print found at the scene of the crime could have come from someone other than the defendant."



PCAST Report (2016):

- Overall, it would be appropriate to inform jurors that **(1) only two properly designed studies of the accuracy of latent fingerprint analysis have been conducted and (2) these studies found false positive rates that could be as high as 1 in 306 in one study and 1 in 18 in the other study.**
- This would appropriately inform jurors that errors occur at detectable frequencies, allowing them to weigh the probative value of the evidence.
- “We also note it is conceivable that the false-positive rate in real casework could be higher than that observed in the experimental studies, due to exposure to potentially biasing information in the course of casework.
- And – “Proficiency testing is essential for assessing an examiner’s capability and performance in making accurate judgments.”

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Defense Forensic Science Center (2015)

- The DFSC reporting statement (initially proposed by Swofford, 2015 and used until early 2017) is as follows:
- "The latent print on Exhibit ## and the record finger/palm prints bearing the name XXXX have corresponding ridge detail. The likelihood of observing this amount of correspondence when two impressions are made by different sources is considered extremely low" (Department of the Army, 2015).



DOJ Uniform Language

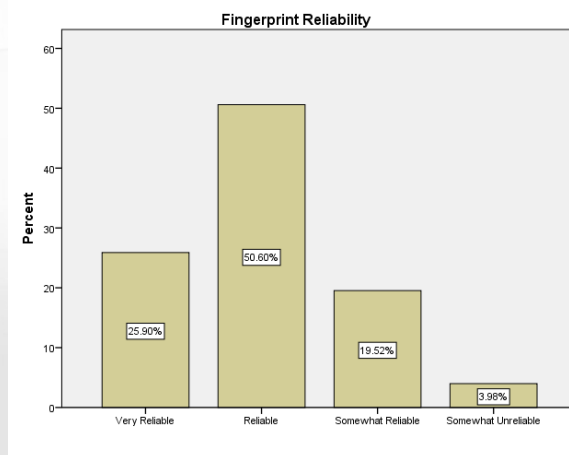
- 'Source identification' is an examiner's conclusion that two friction ridge skin impressions originated from the same source. This conclusion is an examiner's decision that the observed friction ridge skin features are in sufficient correspondence such that the examiner would not expect to see the same arrangement of features repeated in an impression that came from a different source and insufficient friction ridge skin features in disagreement to conclude that the impressions came from different sources.
- An examiner shall not assert that two friction ridge impressions originated from the same source to the exclusion of all other sources or use the terms 'individualize' or 'individualization.'
- An examiner shall not assert a 100% level of certainty in his/her conclusion, or otherwise assert that it is numerically calculated.
- An examiner shall not assert that latent print examination is infallible or has a zero error rate.
- An examiner shall not cite the number of latent print comparisons performed in his or her career as a measure for the accuracy of a conclusion offered in the instant case.
- An examiner shall not use the expressions 'reasonable degree of scientific certainty,' 'reasonable scientific certainty,' or similar assertions of reasonable certainty as a description of the confidence held in his or her conclusion in either reports or testimony unless required to do so by a judge or applicable law.

How do jurors evaluate such information?



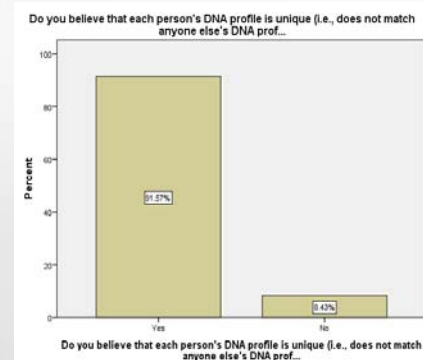
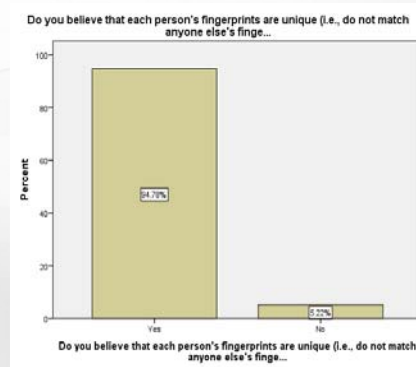
Lay Perceptions of General Fingerprint Reliability

Brandon L. Garrett and Greg Mitchell, Forensics and Fallibility: Comparing the Views of Lawyers and Jurors, 119 WEST VIRGINIA LAW REVIEW 621 (2016)



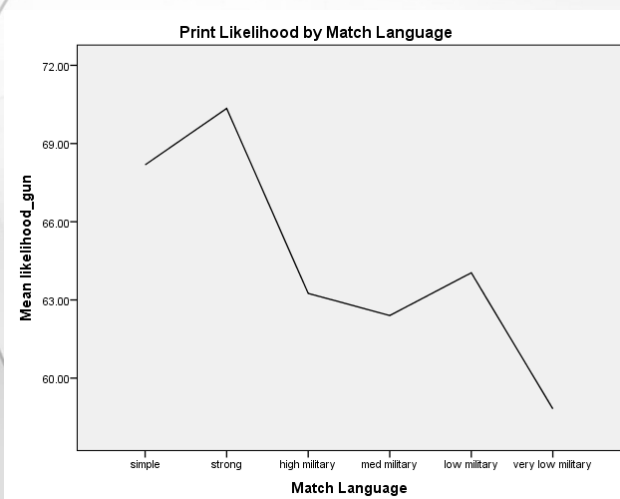
19

Fingerprints vs. DNA



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How do Jurors Evaluate FRSTAT Conclusions Concerning Fingerprint Evidence?



- **JOURNAL OF FORENSIC SCIENCES (2018)**
Brandon Garrett, Gregory Mitchell and Nicholas Scurich
- doi: 10.1111/1556-4029.137 97
- The most probative FRSTAT conclusions were weighted as less strong than a traditional identification conclusion.
- The less probative FRSTAT conclusions were weighted less, but not much less, depending on their strength.
- Additional language describing the procedure did not impact results.

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Introducing Error and Proficiency Data in Court

REPORT TO THE PRESIDENT Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods

Executive Office of the President
President's Council of Advisors on
Science and Technology

September 2016



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Proficiency

- *Brandon Garrett and Gregory Mitchell, The Proficiency of Experts, 166 UNIVERSITY OF PENNSYLVANIA LAW REVIEW 901 (2018)*



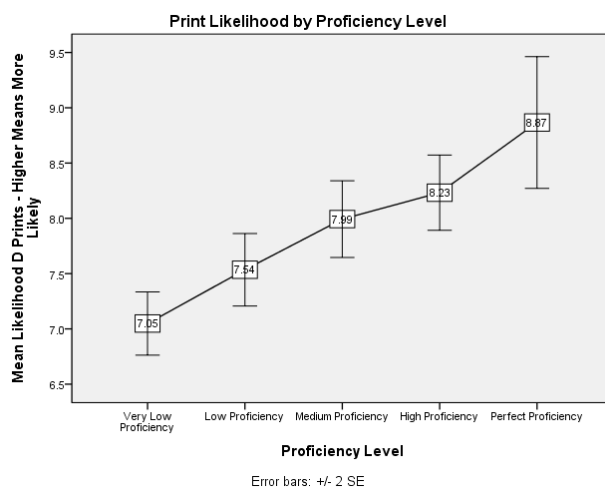
Year (Test #)	N of Prints	N of Test Takers	False Rate	Positive	False Negative Rate (N)	Inconclusive Rate
1995 (9508)	7	156	22% (34)	43% (67)	3% (6)	
1996 (9608)	11	184	8% (14)	N/A	N/A	
1997 (9708)	11	204	10% (21)	28% (58)	N/A	
1998 (9808)	11	219	6% (14)	N/A	35% (77)	
1999 (99-515)	12	231	8% (14)	N/A	32% (75)	
2000 (00-515)	10	278	4% (11)	N/A	N/A	
2001 (01-515)	11	296	3% (8)	N/A	N/A	
2001 (01-517)	11	120	20% (24)	N/A	N/A	
2002 (02-516)	11	303	4% (13)	N/A	1% (2)	
2002 (02-517)	10	146	3% (5)	4% (6)	1% (2)	
2002 (02-518)	12	31	0% (0)	3% (1)	3% (1)	
2003 (03-515)	10	336	1% (4)	8% (26)	N/A	
2003 (03-517)	12	188	1% (5)	12% (22)	N/A	
2003 (03-518)	9	28	7% (2)	11% (3)	N/A	
2004 (04-516)	12	206	4% (12)	3% (7)	N/A	
2004 (04-517-518)	15	259	6% (15)	2% (5)	N/A	
2005 (05-516)	16	327	1% (3)	9% (28)	At least 1	
2005 (05-517-518)	16	250	5% (12)	2% (6)	N/A	
2006 (06-516)	15	333	23% (78)	3% (11)	N/A	
2007 (07-516)	15	351	4% (14)	5% (18)	N/A	
2007 (07-517-518)	15	315	4% (13)	14% (45)	6% (20)	
2008 (08-516)	15	300	1% (3)	5% (14)	N/A	
2008 (08-517-518)	15	391	1% (5)	2% (6)	1% (2)	
2009 (09-516)	16	321	11% (35)	N/A	N/A	
2009 (09-517-518)	16	419	1% (5)	2% (8)	1% (4)	
2010 (10-516)	16	331	8% (26)	2% (5)	N/A	
2010 (10-517-518)	16	463	13% (60)	N/A	N/A	
2011 (11-516)	15	335	9% (30)	N/A	1% (3)	
2011 (11-517-518)	16	478	4% (17)	0	2% (1)	
2012 (12-515-516)	16	350	3% (9)	2% (6)	N/A	
2012 (12-517-518)	12	555	3% (16)	1% (8)	N/A	
2013 (13-515-516)	12	409	2% (8)	2% (1)	0% (24)	
2013 (13-517-518)	15	469	3% (12)	8% (38)	N/A	
2014 (14-515-516)	12	424	4% (18)	3% (13)	N/A	
2014 (14-517-518)	12	587	11% (62)	9% (53)	3% (2)	
2015 (15-515-516)	11	536	7% (39)	12% (59)	1% (1)	
2015 (15-517)	11	509	4% (21)	11% (57)	1% (1)	
2015 (15-519)	3	292	23% (36)	N/A	N/A	
2016 (16-515-516)	16	431	10% (41)	3% (11)	N/A	

Table 1: CTS Fingerprint Proficiency Test Results, 1995-2016

The Impact of Proficiency Testing Information and Error Aversions on the Weight Given to Fingerprint Evidence

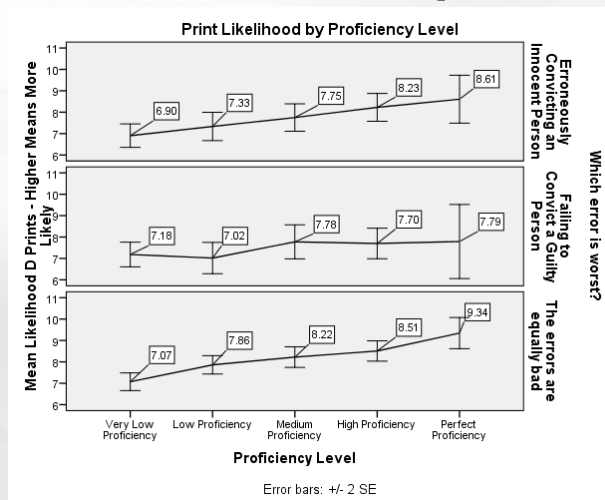
- Gregory Mitchell & Brandon Garrett
- **37 Behav. Science and Law 1 (2018), doi: 10.1002/bsl.2402**
- We commissioned Qualtrics to recruit nationally representative sample with respect to gender, race/ethnicity, age, income, and geographic region in the United States. Total of 1,450 adults participated in the study, which took less than 15 minutes. In addition to asking demographic questions, we gave an objective numeracy test to participants.
- The description of the case was kept simple to keep the Participants focused on the fingerprint evidence itself. The survey software assigned participants to one of 14 conditions with five proficiency levels and three error types, as well as a control in which the examiner received a perfect score on proficiency (with no errors) and a control condition with no proficiency information provided.

Print Likelihood Ratings by Proficiency Level



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Print Likelihood Ratings by Proficiency Level and Error Aversion Group



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Conclusions

- The examiner's level of performance on a proficiency test (high, medium, low, or very low), but not the type of errors committed on the test (false positive identifications, false negative identifications, or a mix of both types of errors), affected the weight given to the examiner's identification opinion, which in turn affected judgments of the defendant's guilt.
- Those with stronger aversions to false acquittals than false convictions, older participants, and White and Asian participants gave greater weight to the fingerprint evidence, but all groups were sensitive to information about the examiner's proficiency level.
- Finally, our results suggest that jurors assume that fingerprint examiners are highly proficient but not perfect: evidence showing that an examiner's proficiency level falls below 90% is likely to inform how jurors evaluate the examiner's testimony.

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PCAST Bottom Line:

- Overall, it would be appropriate to inform jurors that **(1) only two properly designed studies of the accuracy of latent fingerprint analysis have been conducted and (2) these studies found false positive rates that could be as high as 1 in 306 in one study and 1 in 18 in the other study.**
- This would appropriately inform jurors that errors occur at detectable frequencies, allowing them to weigh the probative value of the evidence.

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How about Judges? Judicial Instructions?



- Although “commissions come and go” there is “mounting judicial, and public concern...”

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Brandon L. Garrett & Chris Fabricant,
The Myth of the Reliability Test,
86 Fordham L. Rev. 1559 (2018)

- We assembled a collection of 229 state criminal cases that quote and in some minimal fashion discuss the reliability requirement.*
- We find that in the unusual cases in which state courts discuss reliability under Rule 702 they invariably admit the evidence, largely by citing to precedent and qualifications of the expert or by acknowledging but not acting upon the reliability concern. In short, the supposed reliability test adopted in Rule 702 is rarely applied to assess reliability.*

Appendix II: State Rule 702 Adoption and Usage in Criminal Cases

State	Year Adopted	Cases Discussing Reliability
Alabama ¹⁶⁵	2012	1
Arizona	2012	17
Delaware	2001	4
Florida	2013	1
Georgia	2013	0
Indiana ¹⁶⁶	1994	18
Kansas	2014	1
Kentucky	2007	3
Louisiana	2014	5
Massachusetts ¹⁶⁷	n/a	6
Maryland	1993	1
Michigan	2004	59
Mississippi	2003	37
Missouri	2017	0
New Hampshire	2016	2
North Carolina	2011	14
Ohio ¹⁶⁸	1994	22
Oklahoma ¹⁶⁹	2013	3
South Dakota	2011	2
Utah ¹⁷⁰	2007	13
Vermont	2004	7
West Virginia	2014	2
Wisconsin	2011	11

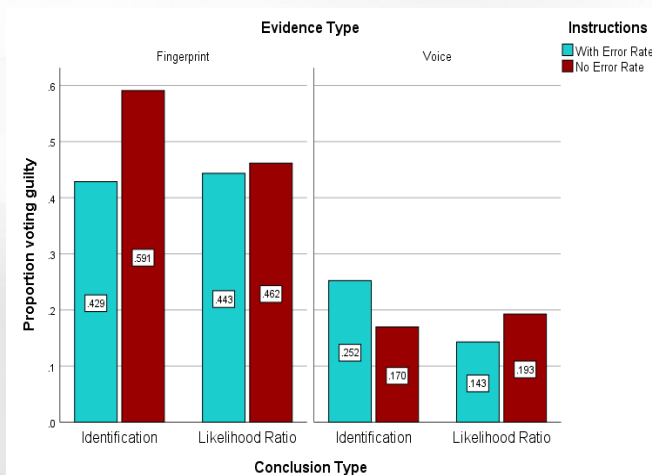
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Work in Progress: Error Rates, Likelihood Ratios, and Jury Evaluations of Forensic Evidence

- Brandon Garrett, Rebecca Grady, and William Crozier
- Mock jurors were surveyed in Amazon Mechanical Turk using a sample of 950 laypeople, using written testimony and judicial instructions. We find that error rate information, presented in judicial instructions, most strongly affected jurors who heard evidence presented as a traditional conclusion that evidence was identified as having come from the defendant. This error rate information, however, did not affect jurors who heard forensic evidence presented using likelihood ratios. Error rate information also affected jurors differently depending on whether they heard fingerprint or voice evidence.

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Error Rates, Likelihood Ratios, and Jury Evaluations of Forensic Evidence

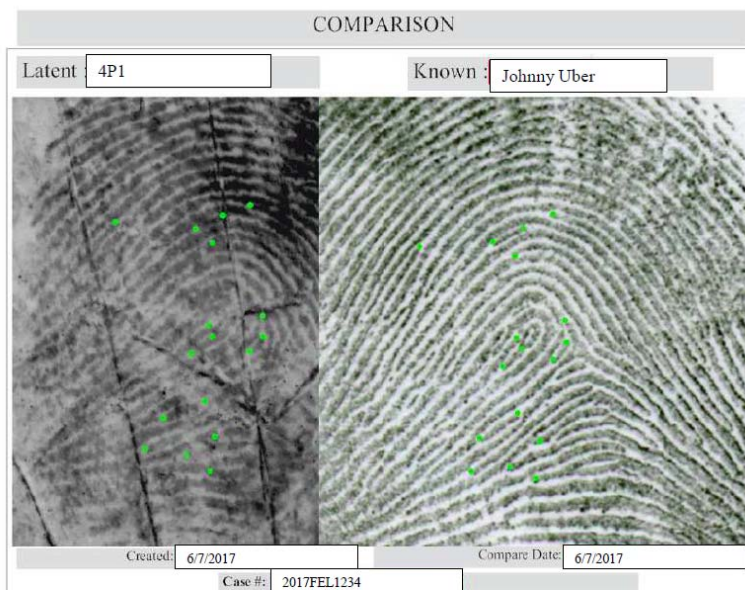


State v. McPhaul

- The examiner concluded that prints on the car and on the pizza and chicken boxes all were “identified” as coming from McPhaul.
- The examiner stated that “[i]t was the left palm of Juan Foronte McPhaul that was found on the back fender portion of the vehicle.”
- And “[m]y conclusions, your Honor, is that the impressions made belonged to Mr. McPhaul.”
- The judge asked, “What did you do to analyze them?”
- The examiner responded, “I did comparisons—side by side comparisons.”
- She could not say what features were relied upon, what process were followed, or what the duration of the examination was.

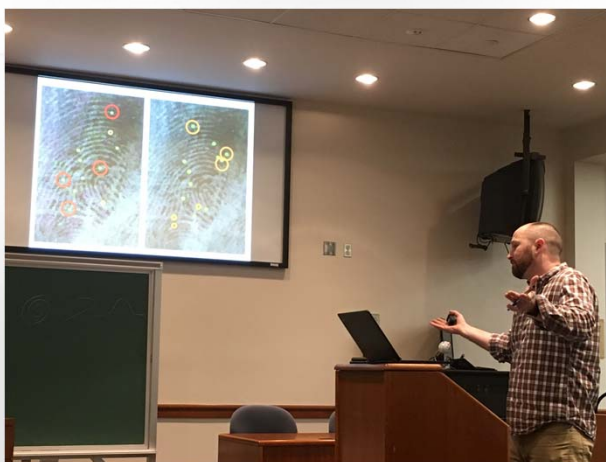
Also - Brandon L. Garrett, The Reliable Application of Fingerprint Evidence, 66 U.C.L.A. L. Rev. Discourse 64 (2018)

Forensics Litigation Mock-Trial Casefile



Verified: MP

How are the prints marked?



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New Studies



Expert II



New Forensics Forum Blog @DukeLaw

