



# When is Their Best Not Good Enough?

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# Form Blindness

- “Form-blindness is a combined physical and mental fault, an imperfection in the brain which causes the inability to interpret and correctly store what is actually focused on the human retina” – Byrd and Bertram, 2003.
- “The inability to see minute differences in form regarding shapes, curves, angles and size.” – Michele Triplett’s Fingerprint Dictionary.

# Measuring What Matters

- No correlation between ability to efficiently and accurately conduct comparisons and:
  - Age\*
  - Level of Education
  - Area of Study\*
  - Gender
  - Martial Status
  - Race\*
  - Color Blindness

# Measuring What Matters

- There is one correlating factor:

**FORM BLINDNESS**

## Byrd and Bertram, 2003

- “The problem that most agencies have with form-blindness testing is that there has never been any research to validate these testing procedures as accurate or reliable.”

# Validation

- 1) **Face Validity** - theoretical, articles of existence, old ways of testing
- 2) **Predictive Validity** - how well it can be predicted using tests
- 3) **Content Validity** - does the content measure what it is supposed to
- 4) **Construct Validity** - performance measures on test are consistent with predictions

# Face Validity

This was determined using existing written material with the following conclusions:

- 1) Literature contends that form blindness occurs in the brain, not the eye.
- 2) Literature claims that the majority of persons do not have form blindness.
- 3) Literature states that the ability to see minute differences in angles, shapes, and sizes is an ability not everyone possesses

# Predictive Validity

How well can these tests predict success in a latent print examiner training program?

- 1) **Byrd, Jon S. and Bertram, Dean J.,** “Form Blindness,” May/June 2003, 53(3) Journal of Forensic Identification, pp. 315-341
- 2) **Bertram, Dean J., Carlan, Philip E., Byrd, Jon S., and White, Joseph L.,** “Screening Potential Latent Fingerprint Examiner Trainees: The Viability of Form Blind Testing,” July /August 2010, 60(4) Journal of Forensic Identification, pp. 460-476



# Byrd, Jon S. and Bertram, Dean J.

## “*Form Blindness,*”

- 111 students participated in the study over the course of one year
- Each student was given two different pre-tests, both of which were form blindness tests
- Comparison test was given at the end of the training as the post-test.
- Found significant correlation between high scores on the pre-test and high scores on the post-test.

**Bertram, Dean J., Carlan, Philip E., Byrd, Jon S., and White, Joseph L.**

**Screening Potential Latent Fingerprint Examiner Trainees: The Viability of Form Blind Testing**

- 327 students participated in the study over a five-year period.
- Similar study design
- Students with fingerprint training scored 35% higher on the fingerprint comparison post-test than those who were not trained.
- Students with lower scores on the form blindness pre-test scored significantly lower on the fingerprint comparison test.
- Fingerprint comparison scores do not differ significantly along demographic lines.
- Fingerprint comparison scores can be reliably predicted from form blindness performance measures; ie test scores indicate an ability level.

# Content Validity

Can the content of the test developed by RS&A determine the variability in visual acuity skills?

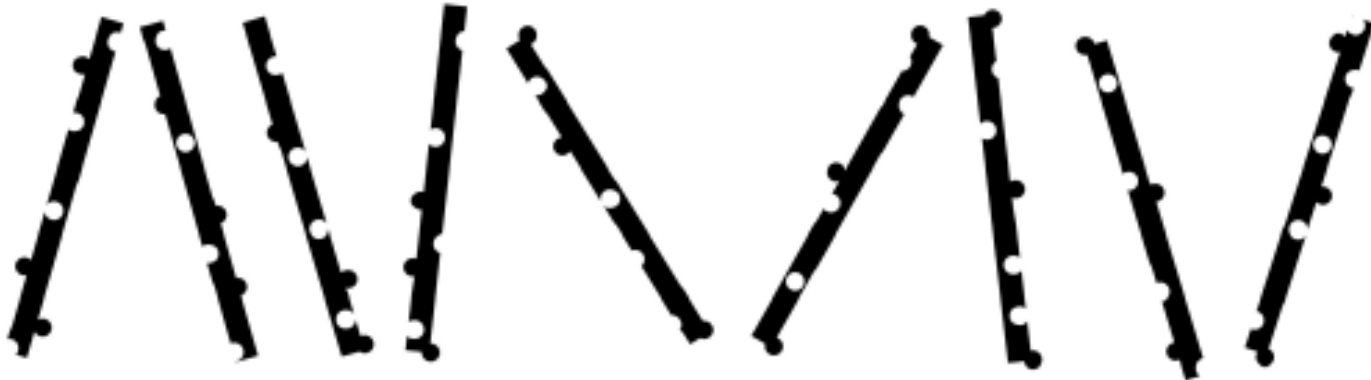
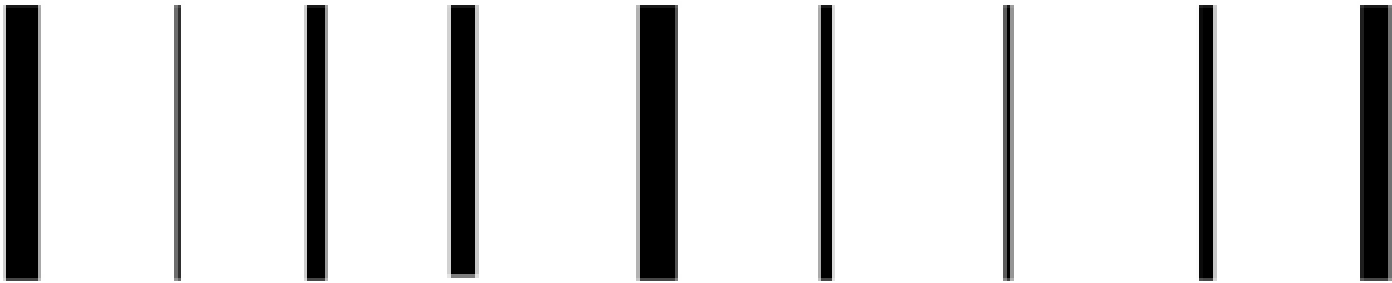
RS&A Developed Visual Acuity Test #112:

Test consists primarily of form blindness tests developed by RS&A in consultation with Dr. Itiel Dror.

The only additional non-form blindness content to the test was a color-blind section based on the most common colors experienced in latent print processing.

# RS&A Visual Acuity Test #112

- 1 hour to complete the test.

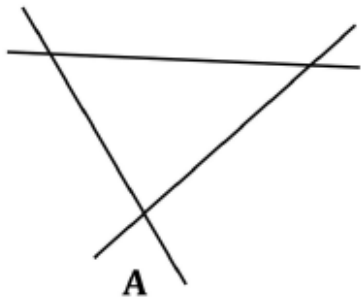


RS&A

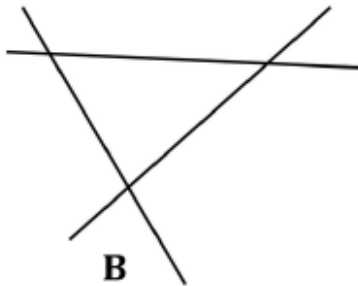
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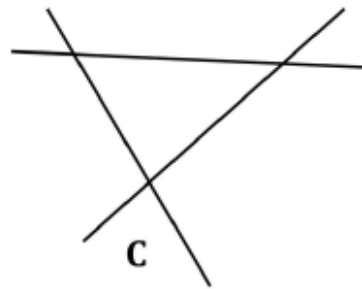
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**A**



**B**



**C**

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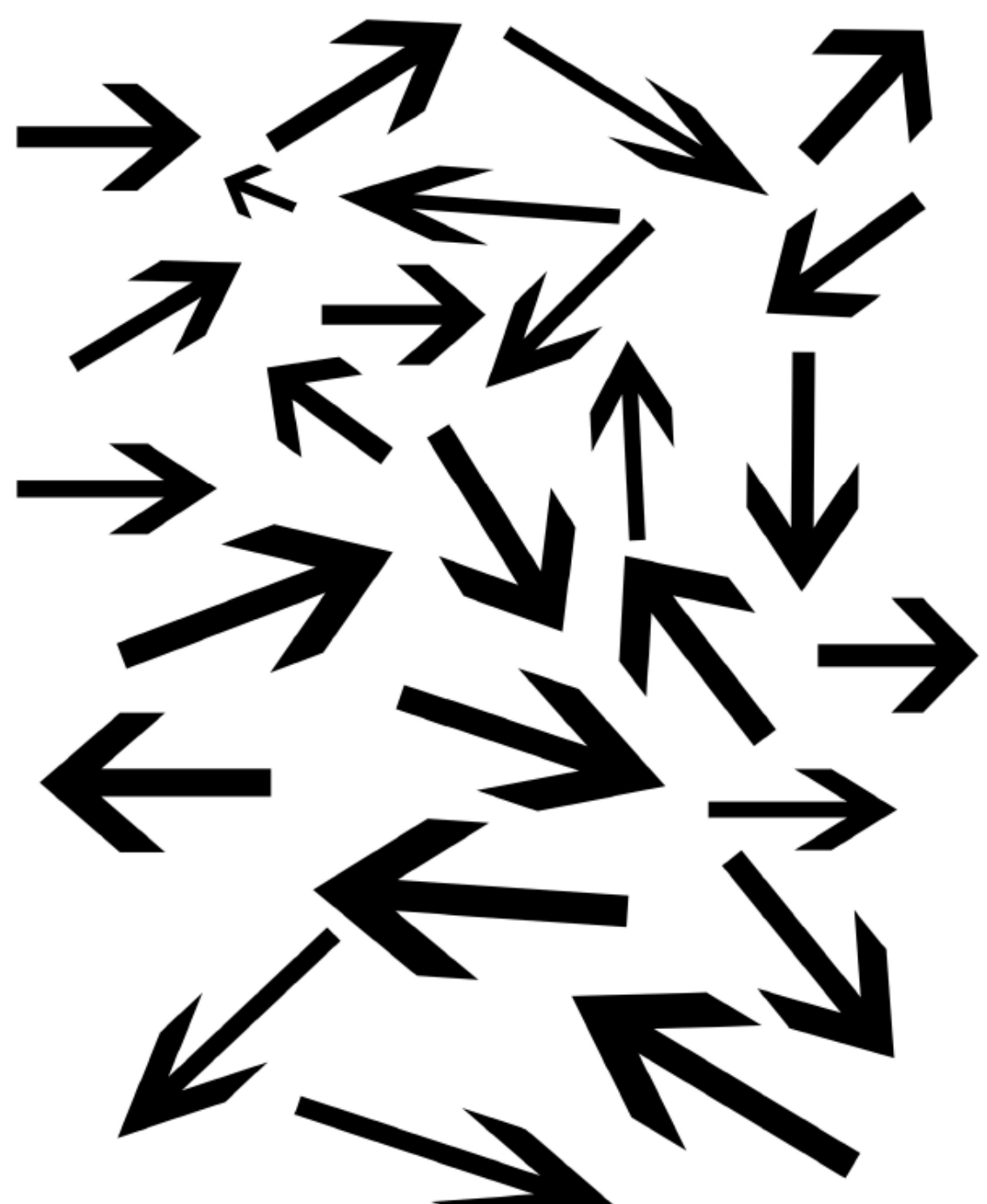


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# Quarter



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are  
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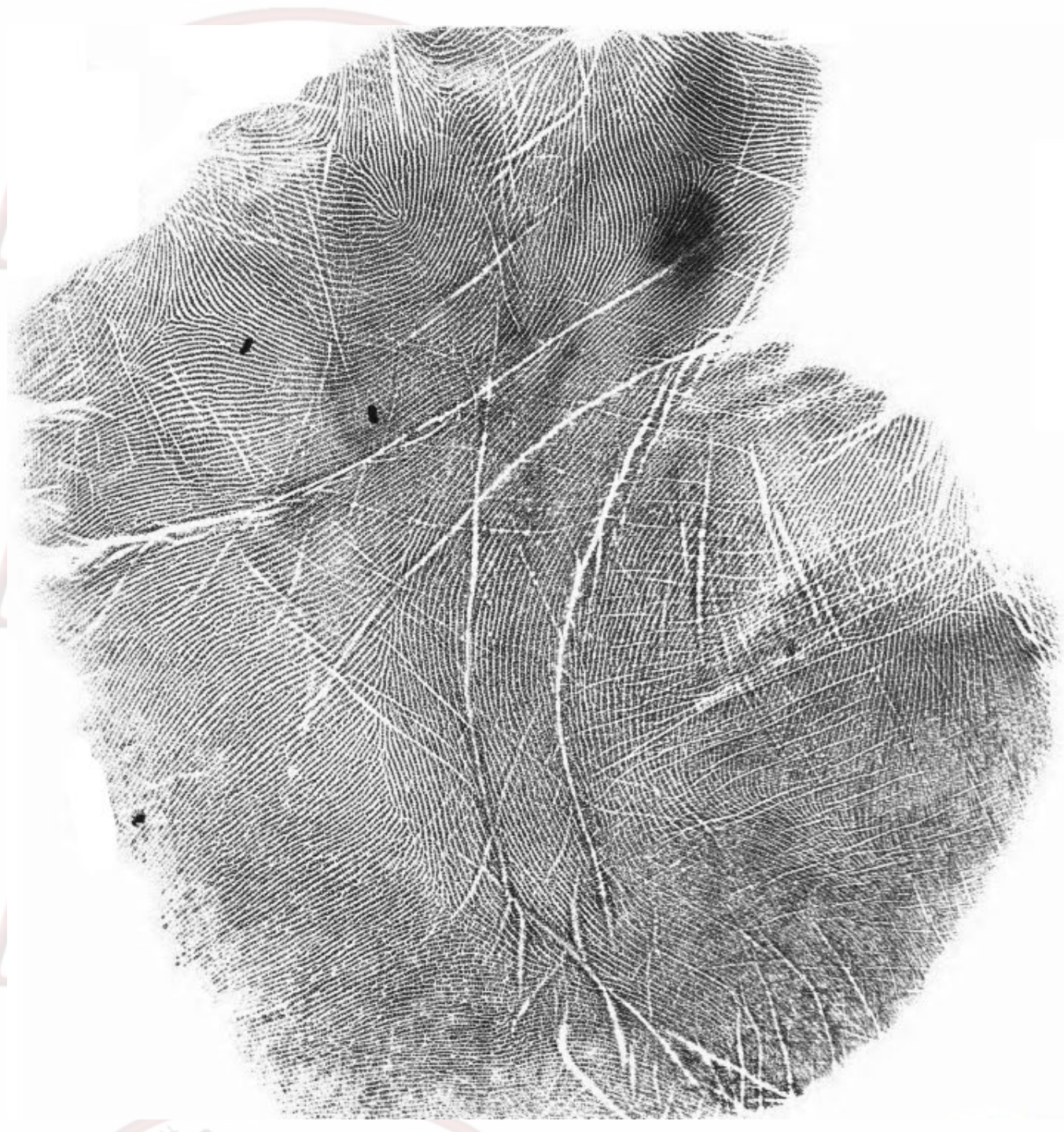
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# Scoring

- Excellent = 90-100 points
- Average = 80-89 points
- Below Average = 70-79 points
- Poor = 69 or less

# RS&A Visual Acuity Test #112

Given to 118 High School Students

Check for Variability in Visual Acuity Skills

## High School Validation Results (Test #112)

Score Range	Test Category	# of Incorrect Answers	#of Respondents
100 - 90	Excellent	0 to 10	18 (15%)
89 - 80	Average	11 to 18	43 (37%)
79 - 70	Below Average	19 to 30	39 (33%)
69 and below	Poor	31 +	18 (15%)
			Total - 118

# RS&A Visual Acuity Test #112

Given to 85 College Students Majoring in Forensic Science who were told this would count for a grade.

## College Validation Results (Test #112)

Score Range	Test Category	# of Incorrect Answers	#of Respondents
100 - 90	Excellent	0 to 10	36 (42%)
89 - 80	Average	11 to 18	28 (33%)
79 - 70	Below Average	19 to 30	10 (12%)
69 and below	Poor	31 +	11 (13%)
			Total - 85

Both tests support that not all persons have an equal ability to discern minute differences in angles, shapes, and sizes, which are common elements in friction ridge comparisons.



# Construct Validity

Can the test being used predict success in a latent print training program?

- The same 85 college students were given a final comparison exam at the completion of the course. The 85 students were told that the final comparison exam would count for 1/3 of their final grade.

## College Validation Results (Test #112)

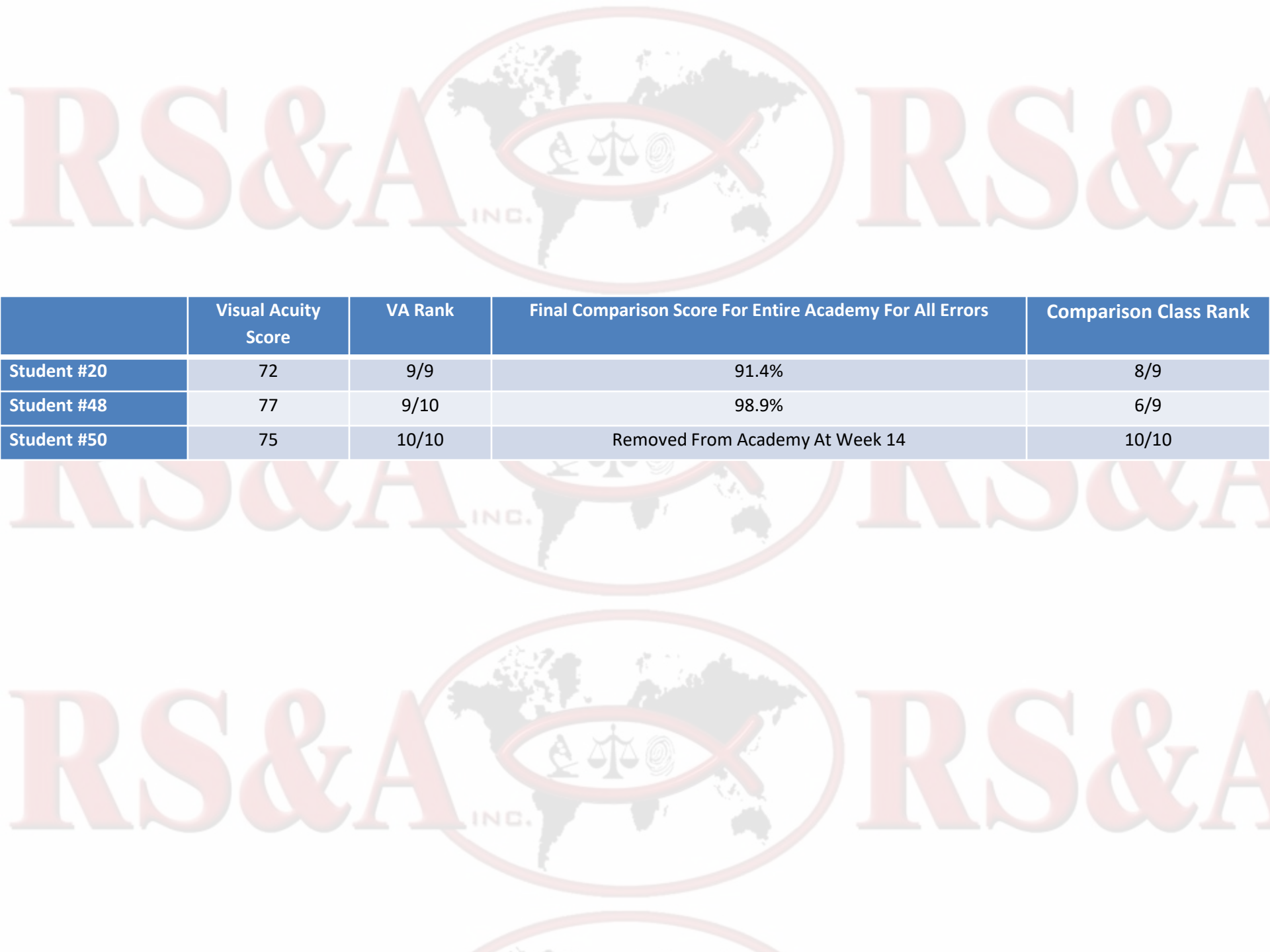
Test #112 Score	#of Respondents	Final Comparison Score	#of Respondents
100 - 90	36 (42%)	100 - 90	32 (38%)
89 - 80	28 (33%)	89 - 80	30 (35%)
79 - 70	10 (12%)	79 - 70	15 (18%)
69 and below	11 (13%)	69 and below	8 (9%)
	Total - 85		Total - 85

# International Latent Print Examiner Training Academy Results

## RS&A Academy Validation Results (Test #112) (through 2019/20)

Score Range	Test Category	# of Incorrect Answers	#of Respondents
100 - 90	Excellent	0 to 10	63 (76%)
89 - 80	Average	11 to 18	18 (22%)
79 - 70	Below Average	19 to 30	3 (2%)
69 and below	Poor	31 +	0 (0%)
			Total - 84

	Visual Acuity Score	VA Rank	Final Comparison Score For Entire Academy For All Errors	Comparison Class Rank
Student # 51	91.5	16	99.5%	3
Student # 52	89	17	99.3%	8
Student # 53	88	19	98.8%	13
Student # 54	99.5	5	99.1%	17
Student # 55	85	21/23	97.3%	22/23
Student # 56	100	1	99%	7
Student # 57	98	7	98.3%	18
Student # 58	92	15	98.3%	11
Student # 59	93	14	96.4%	23
Student # 60	95	12	97.8%	18
Student # 61	94	13	98.4%	9
Student # 62	98	7	98.5%	9
Student # 63	100	1/23	99.6%	1/23
Student # 64	99	6	99%	6
Student # 65	87	20	98.5%	13
Student # 66	97	10	99.4%	5
Student # 67	97	10	98.4%	20
Student # 68	85	21/23	99.5%	2/23
Student # 69	98	7	98.5%	15
Student # 70	100	1	98.4%	12
Student # 71	89	17	98.4%	15
Student # 72	85	21/23	97.8	21/23
Student # 73	100	1	99.6	3



	Visual Acuity Score	VA Rank	Final Comparison Score For Entire Academy For All Errors	Comparison Class Rank
Student #20	72	9/9	91.4%	8/9
Student #48	77	9/10	98.9%	6/9
Student #50	75	10/10	Removed From Academy At Week 14	10/10




Excellent = 90-100 points

Average = 80-89 points

Below Average = 70-79 points

Poor = 69+ points



# Conclusions

- The visual acuity test not only predicts how well a student will do in the program, but more importantly, it accurately predicts their visual ability level which is of the highest concern when training someone in a comparative science.
- Visual Acuity is not the only factor that makes a good trainee or examiner.
- Form Blindness does not appear to be something you have or don't have, but rather can manifest in varying degrees.
- There is a level of ability to distinguish forms below which an examiner is unable to overcome this deficiency despite their motivation or the motivation of the trainer.

# References

- 1) **Ashbaugh, David R.**, “Ridgeology” Journal of Forensic Identification, 41(2), January/February 1991, p.16
- 2) **Ashbaugh, David R.**, “Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology”, 1999, pp.103-108
- 3) **Byford, William**, “Recruiting and Testing Fingerprint Experts & Crime Scene Examiners: A Research and Development Project” Unpublished
- 4) **Byrd, Jon S. and Bertram, Dean J.**, “Form Blindness,” May/June 2003, 53(3) Journal of Forensic Identification, pp. 315-341
- 5) **Bertram, Dean J., Carlan, Philip E., Byrd, Jon S., and White, Joseph L.**, “Screening Potential Latent Fingerprint Examiner Trainees: The Viability of Form Blind Testing,” July /August 2010, 60(4) Journal of Forensic Identification, pp. 460-476
- 6) **Osborn, Albert S.**, “Form Blindness and Proof: Sight Defects in Relation to the Administration of Justice” Journal of the American Institute of Criminal Law and Criminology, Vol. 30, May-June, 1939-March-April, 1940, p.243
- 7) **Osborn, Albert S.**, “Questioned Document Problems” 2nd ed. New York: Boyd Printing Co., 1946
- 8) **Osborn, Albert S.**, “Questioned Documents” 2nd ed. New York: Boyd Printing Co., 1946
- 9) **Wertheim, Pat A.**, “The Ability Equation” Journal of Forensic Identification, 46(2), March/April 1996, p.149



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