Development of a Reasonable Minimum Documentation Standard in Latent Print Analysis and Comparison

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Contemporaneous Bench Notes

Interpretation leads to Variability

Documentation Philosophy

- Why document?
- Who is documentation for?
- What are good scientific practices?
- What is operationally palatable or feasible?
- Do we really have to?

Why document?

- In all science, documentation creates a record of *what was done*

  - *Another competent scientist should be able to read the record and know what was done, and how*
- Transparency
- Auditability
- Error accountability and remediation
- Memory aid
- Demonstrate validity/basis of the conclusion
- Decrease variability/Increase accuracy

Who is documentation for?

- Ourselves
  - Aid in memory
  - Understand errors
  - Find information easily on the stand
- Technical Reviewer
  - Provide a basis to verify the validity of methods/conclusions
- Auditors
  - Provide evidence of compliance with standards
- The Courts
  - Transparency

What are good scientific practices?

What are good scientific practices?

- ASCLD/LAB

  - 4.13.2.5 "Records to support conclusions shall be such that in the absence of the analyst (however named), another competent reviewer could evaluate **what was done and interpret the data**."

What are good scientific practices?

- ASCLD/LAB
  - They go on to say:
  - Note: "Examples of ways to record **the basis for conclusions** derived from evidence examination/ analysis, include, but are not limited to: a narrative description of the examination/analysis process and **observations made**, photographs, photocopies, diagrams, drawings, worksheets."

What are good scientific practices?

- ASCLD/LAB
- BUT...
  - 4.13.2.5.1 "Records to support conclusions in the latent print discipline shall meet all applicable requirements in Appendix C – *Latent Print Examination Records*, **in addition to** meeting all applicable examination record requirements specified in Section 4.13"

What are good scientific practices?

- ASCLD/LAB
- BUT...
  - Appendix C: "Examination records **do not have to provide a detailed description of the thought process** involved in the analysis, comparison or evaluation."

What are good scientific practices?

- NAS Report
  - "Better documentation is needed of each step in the ACE-V process or its equivalent. At the very least, sufficient documentation is needed to reconstruct the analysis, if necessary. By documenting the relevant information gathered during the analysis, evaluation, and comparison of latent prints and the basis for the conclusion (identification, exclusion, or inconclusive), the examiner will create a transparent record of the method and thereby provide the courts with additional information on which to assess the reliability of the method for a specific case. Currently, there is no requirement for examiners to document which features within a latent print support their reasoning and conclusions."

What are good scientific practices?

- SWGFAST (Standard for Documentation)
  - For all latents/comparisons:
    - "…[D]ocumentation shall be such that another qualified examiner can determine what was done and interpret the data."
    - "Although all examinations require documentation, the extent of the documentation is related to the complexity of the examination. **The friction ridge impression alone is not sufficient documentation**. The impression or a legible copy shall be annotated or have accompanying notes."
    - "An examiner marking or noting the anatomical source and anatomical orientation of latent prints documents how he or she searched or compared, or intends to search or compare, the latent print."

What are good scientific practices?

- SWGFAST (Standard for Documentation)
  - For **complex** latents/comparisons:
    - "Complex latent examinations require extensive documentation by the examiner during the analysis and subsequent comparison phase of the examination process to establish a foundation for conclusions…"
    - Analysis: "All significant features should be marked on the enlargement(s)[…] in an appropriate manner to allow another examiner to clearly distinguish the features as interpreted during analysis."
    - Comparison: "All significant features should be marked on the enlargement(s)[…] in an appropriate manner to allow another examiner to clearly distinguish the features relied upon during comparison. Any significant differences in features observed during analysis and those relied upon during comparison and providing a basis for the conclusion shall be noted and discussed in the notes."

Do we really have to?

- Not yet...
- Depending on your accreditation assessor's interpretation of the standard
- It's just good practice

- BUT...
- It's coming
  - NCFS
  - OSAC

- So, where do you begin?

One Agency's Journey

Documentation Exercise

- Determine the state of current practice within the unit
- 7 full-time examiners, 1 supervisor
- Requirements at beginning of study
  - Name the latent
  - Indicate orientation
  - Indicate anatomical source
  - Cannot Exclude
  - Beyond that, analyst discretion

Source/Orientation Markings

Documentation Exercise

- Methods Used
  - 55 lift cards
  - Worksheet
  - Mark all latents deemed "of value" per suitability standard
  - Take notes as you feel appropriate
  - Indicate if you **would** chart, if a suitable exemplar was provided
- Results
  - Not every latent had consensus on value
  - Very low consensus on charting
  - Highly variable note-taking

Ratings Exercise

- Correlate amount and type of documentation currently being done to the difficulty, or quality, of the latent
- Method
  - In a group, participants were shown the latents they previously selected
  - Asked to rate the difficulty of the latent on a scale of 1 to 5
    - "Difficulty" = how easy or difficult it would be to **search** the latent and to **render a definitive conclusion**
  - Determinations were made fairly quickly to get a "gut reaction" response

Ratings Exercise

- Results
  - Very low consensus on value decisions
  - Value Decisions:
    - Consensus decreased in lower categories
  - Charting:
    - Desire to chart increased in lower categories
  - Confounding Effects:
    - Sample size
    - Analyst style/preference

Ratings Categorization Factors

- Define the key attributes that different Categories have in common
- Method
  - Reviewed the latents by Category
  - For each latent, brainstormed what attributes were visible that made it a better, or worse, latent
  - Tried to use the attributes to create a "score" for each latent, and see if the scores grouped around the Category bins
- Results
  - A great deal of variability, also a lot of overlap between scores and Categories
  - Decided to reduce to 3 bins
  - Decided to simplify the number of attributes to key observations and eliminate redundancies

Positive Attributes Checklist Exercise

- Turn the categorization factors into a simple checklist
  - All positive statements that participant could agree, or disagree, with
  - 21 factors to evaluate
  - Covered every aspect of quality and searchability we could come up with that might factor into someone's value decision
  - Also had participants sort latents into 3 subjective bins

Positive Attributes

Orientation known

Gross anatomical region known (e.g. finger or palm)

Specific anatomical region known or narrowed (e.g. specific finger or specific region of palm)

Pattern type (or approx.) OR Delta (or approx.)

Distinctive ridge flow not associated w/ a pattern that narrows search area (e.g. funnel)

Primary crease(s) present

Robust secondary crease(s) or pattern(s) of creases

Distance (or ridge count) between two anchors (core, delta, primary crease) known

High minutiae count

High specificity feature(s) or cluster(s)

Presence of a useful target group

Large surface area

Easy to search

Able to exclude without difficulty

Robust, solid ridges (not spotty, too thin, or diffuse; i.e. easy to follow)

No significant noise (smearing, dragging, surface texture or pattern issues, etc.; i.e. easy to see)

No overlays or double-taps

All detail being used is contiguous

No tonal transitions (fully light ridges doesn't count)

Same source latent-to-latent with another impression in the case

Other features of note available (e.g. scars, warts, incipients)

Positive Attributes Checklist Exercise

- **Results**
  - Surprisingly little consensus in both subjective bin scores and across attributes
  - High consensus on orientation or pattern known
  - Low consensus on:
    - Useful target group present
    - Large surface area
    - Robust ridges
    - No significant noise

Positive Attributes Checklist Exercise

- Results (continued)
  - Even **with** all this variation, there was a rough correlation between scores and bins
  - If you do enough averaging, you can get just about anything to converge
  - Consensus seemed fairly reliable, but casework isn't done by consensus
- Improvements to Concept
  - Not all checkboxes should be weighted equally
  - There were really three categories of attributes: Searchability, Quality, Weight and these should be grouped and **appropriately weighted**
  - Variability may be reduced through training, particularly on ambiguous attributes

Short Form

- Training was provided on the definitions of each attribute, along with images that exemplified each
- The form was re-organized, and simplified, reducing the number of attributes to 10, and weighting them
- A batch of 35 latents was evaluated using the new form

Short Form

Specific anatomical region known or narrowed (e.g. specific finger or specific region of palm)

Anchor (e.g. core, delta, primary crease, robust secondary creases, funnel) visible

Distance (or ridge count) between two anchors (core, delta, primary crease) known

Ridges are robust and easy to follow (e.g not spotty, too thin, faint, or diffuse)**

Latent is easy to see (e.g. no significant noise, smearing, dragging, overlays, double-taps, background issues, etc.)**

No tonal transitions (fully light ridges doesn't count)

All detail being used is contiguous

High minutiae count (12+ finger; 20+ palm)

High specificity feature(s) or cluster(s)

Other features of note available (e.g. scars, warts, incipients)

Subjective Bin Definitions

1 - Latent is incomplete, difficult to see, distorted, or lacks anchors. If a definitive conclusion were reached, it would be appropriate to justify how that decision was made. This latent may be at or near the suitability threshold.

2 - This is a standard-quality latent. While most examiners would agree there is enough information to be "of value", it is by no means an "easy" or "pretty" latent. There may be some problem areas, and it is possible, though less likely, that the latent could result in disagreements between examiners regarding suitability or sufficiency.

3 - This is a clear, high quality latent. Information is abundant and any competent examiner should be able to easily see the basis for the decision without documentation to highlight that basis. Disagreements regarding suitability or sufficiency are not expected.

Short Form

- Results
  - Consensus results are still good, but individuals still vary widely
  - Conformance with self, and with group averages of scores and bins sits around 70%
  - Is this close enough??

- How do we set rules for documentation of "easy" or "complex" latents, if there is no consensus on which ones are easy versus complex?
- If consensus fails to provide an objective standard, it will simply have to be agreed upon operationally

Defining Categories

- What makes a latent an easy one versus a complex one?
    - Potential for disagreement
    - Anticipated difficulty in comparison/exclusion
    - The feeling that you need to justify your conclusion

- Each of these will move the threshold and differing philosophies may account for individual variability

Developing a Minimum Standard

What is reasonable?

What is operationally palatable or feasible?

- **Analysis**
  - Easy marks
    - Assessment Only
  - Standard marks
    - Assessment
    - Mark minimum threshold minutiae
    - Note what will be searched
  - Complex marks
    - All of the above, **plus**
    - <u>All</u> minutiae used as a basis for the value assessment
    - Weight/confidence of minutiae used
    - Discussion of problem area(s)
- **Comparison**
  - Complex marks
    - All features in agreement marked
    - Discussion of any problem area(s) or apparent discrepancies

What is operationally palatable or feasible?

- But this still depends on distinguishing between "standard" and "complex" marks
- Another approach
    - Chart all inclusions
    - Basis for the conclusion
    - Technically review the charts

What about exclusions?

- Target group(s) searched annotated on latent
- Note exclusion criterion used to justify exclusion
  - Target group not found _and_ anchor present _and_ appropriate exemplar area clearly recorded
  - TG not found _and_ orientation/anatomical source known _and_ appropriate exemplar area clearly recorded
  - TG not found _and_ ALL areas of exemplars fully and clearly recorded to non-friction ridge skin
  - TG or some similarities found, but sufficient disagreement found to preclude an ID (close non-match)
  - Location known _and_ sufficient disagreement found to preclude an ID
  - Level One exclusion with no indications of pattern-altering distortion present

Questions?

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