Sufficiency for Exclusion Opinions

Contents

Definitions

Anchor Point: a significant portion of either a core, delta, primary crease, or permanent scar.

Distortion: variances in the reproduction of friction ridge skin caused by factors such as pressure and movement.

Erroneous Exclusion: the incorrect opinion that two friction ridge impressions did not originate from the same source.

Exclusion: the opinion that two friction ridge impressions did not originate from the same source.

Quality: the clarity of the features within a friction ridge impression.

Quantity: the amount of information contained within a friction ridge impression[1].

Suitability[1]: an examiner's decision that there is sufficient quality and quantity of information within an unknown friction ridge impression to warrant a comparison to a known friction ridge impression.

Target Group: a distinct group of two or more friction ridge features in sequence without significant distortion present.

Summary

This document outlines a set of conditions that should be met before an examiner renders an exclusion opinion. The examiner must evaluate whether there is sufficient, reliable ridge features in disagreement from two known areas to form the opinion that a friction ridge impression did not originate from a specific individual. If the examiner is unable to render an opinion of identification or exclusion, after all available ten print forms for the individual have been exhausted, the examiner should form an inconclusive opinion.

To assist the examiner in determining sufficiency in the latent and exemplar impressions the examiner may refer to the quality table and sufficiency graph (shown below) that has been recommended by SWGFAST.

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[1] Sometimes referred to as "Sufficient" or "Sufficiency".

SWGFAST Quality Table[2]

Quality	Observable	Tolerance
High	Level 1 detail is distinct Level 2 detail is distinct There are abundant distinct level 3 details	Low
Medium High	Level 1 detail is distinct Most of the level 2 details are distinct There are minimal distinct level 3 details	Low
Medium Low	Level 1 detail is distinct Few of the level 2 details are distinct There are minimal distinct level 3 details	Medium
Low	Level 1 detail may not be distinct Most of the level 2 details are indistinct There are no distinct level 3 details.	High
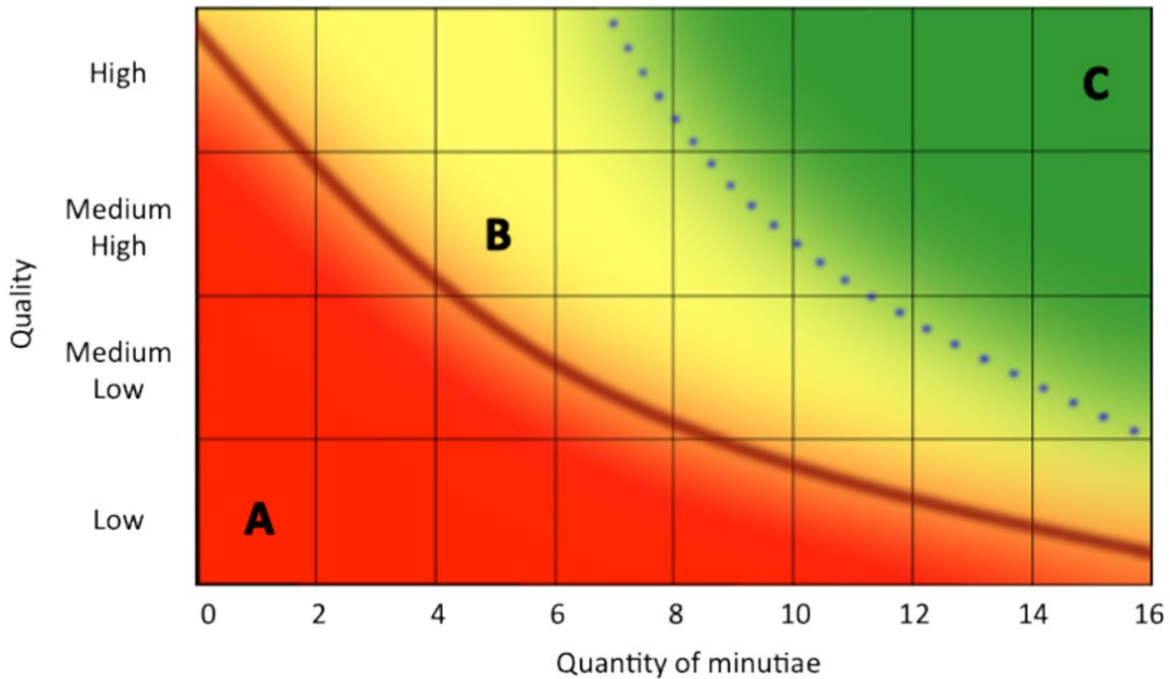
SWGFAST Sufficiency Graph

The solid curve (to provide a visual aid only) defines the lower limit of the sufficiency of friction ridge details. The dotted curve (to provide a visual aid only) indicates the boundary between levels of complexity (complex versus non-complex). In the area marked B, the assessment is considered complex. In the area marked C, the assessment is considered non-complex.

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[2] SWGFAST, Document #10 Standard for examining friction ridge impressions and resulting conclusions, Ver 2.0, posted 2013-04-27.

Note: The sufficiency graph **<u>does not suggest or endorse</u>** the use of minutiae counts as the sole criteria for a decision threshold.

Purpose

The intent of this document is to make friction ridge examiners' opinion statements more accurate and defendable by providing guidance to reduce the numbers of potential erroneous exclusions.

In a peer reviewed article published in the Journal of Forensic Identification "A Performance Study of the ACE-V Process: A Pilot Study to Measure the Accuracy, Precision, Reproducibility, Repeatability, and Biasability of Conclusions Resulting from ACE-V Process", the author Glenn Langenburg provided three possible reasons for erroneous exclusions:

1. The examiner simply missed it. The examiner compared the area in the exemplar from which the mark originated, but did not observe corresponding features between the latent and known to be from the same source.
2. The examiner did not actually compare the corresponding areas of friction ridges. Possibly the examiner misinterpreted the anatomical source (e.g. thought it was digit when it was a partial palm) of the latent, or the exemplar impressions were missing the requisite area that was needed for the comparison.
3. The examiner made a true erroneous exclusion. The examiner noted perceived differences between the latent and known prints and incorrectly placed too much weight on these differences.

Procedure

An exclusion statement is one of three possible opinion positions available to a friction ridge examiner. To ensure a more robust and defendable exclusion opinion, CanFRWG recommend that the following criteria are met prior to forming an exclusion opinion:

1. The latent impression must contain sufficient friction ridge information to confidently allow the examiner to determine the anatomical area (location) and orientation of friction ridge skin that made the impression such as a specific friction ridge pattern (e.g. distal, proximal, medial phalange, or specific area in the palm i.e. interdigital, thenar, hypothenar regions).
2. If condition (1) is met and there is disagreement in reliable level 1 pattern flow features and orientation (cores, deltas, recurves and creases), without significant distortion present, an opinion of exclusion can be made with use of level 1 detail only.
3. If condition (1) is met and there is agreement in reliable level 1 pattern flow features and orientation (cores, deltas, recurves and creases), without significant distortion an opinion of exclusion can be made only with significant differences in level 2 detail.
4. If condition (1) is met and there is distortion an exclusion opinion can be made only with significant differences in level 2 detail.

*   The use of two target groups can be used in lieu of an anchor point to render an opinion of exclusion. If the latent impression contains a minimum of two distinct target groups, which have high clarity[3], in sequence, and are in disagreement with the exemplar print(s) a finding of

exclusion can be rendered. Furthermore, the specific anatomical locations of the target groups in the latent impression used for the comparison to the exemplar print(s) must be in a location that is reliably and accurately recorded in the exemplar print(s).

- If distortion is observed within the impression, the examiner should consider the possible changes to the appearance of the impression (distortion factors), such as, but not limited to compressed ridges/patterns and lateral-twisting artifacts.
- When employing target groups, careful consideration of the target group's configuration, location, orientation and clarity should be taken into account.
- An exclusion based on an impression with significant distortion and/or without a reliable anchor point are considered high risk exclusions. In these circumstances, prior to coming to an opinion; examiners should reflect on the latent impression and the exemplar impression's quantity and clarity of detail available to render a reliable, defendable opinion of exclusion. In cases where there is not a reliable anchor point and the anatomical location or orientation are questioned then the examiner should consider an opinion of inconclusive, as opposed to exclusion, for a defendable and reliable position.
- On its own, Level 3 detail cannot be used by the examiner to reach an opinion of exclusion. Level 3 detail must be used in conjunction with level 2 detail.
- See appendix "A" for a decision tree for exclusion opinions.

To ensure a proper determination of exclusion has been reached, it is recommended that a complete ACE-V process be completed including the blind verification/peer review stage.

When an examiner renders an opinion of inconclusive due to insufficient detail provided in the exemplar impression(s), the examiner is expected to compare further exemplar impression forms from the source if available. This is an important procedure to reduce the number of inconclusive conclusions and to provide stakeholders with sound forensic evidence.

Erroneous exclusions should be reported through the proper channels and be recorded for developmental and statistical opportunities.

Conclusions

The use of anchor points and target groups for exclusion comparisons reduce the chance that the matching features will be overlooked by the examiner during the comparison. Friction ridge examiners following the outlined criteria will have a sound, evidence-based procedure for rendering exclusion opinions, which will help to reduce erroneous exclusions and provide them with support for their opinions in a court of law. It is worth noting that not even strict adherence to the above procedure will reduce all erroneous exclusions.

References

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Appendix A – Decision Tree

Note: The decision tree below does not provide detail about the sufficiency required for identification opinions. It only provides guidance for forming exclusion opinions.