Digging into the Source Opinion Standard

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Disciplines

- Framework for discipline specific opinion scale standard.
  - Encompasses Facial and Iris Identification (FII) and the Video/Imaging Technology and Analysis (VITAL)
- Specific to comparisons of people, objects, or scenes captured in images

Disciplines

- Images of vehicles from SWGDE Technical Overview for Forensic Image Comparison v1.0
- Images of faces from Ideal Innovations, Inc. FaCE Training Database

History & Limitations of Facial Identification

- Started in law enforcement in 1840's

- Has expanded to the following applications:
  - Screening and Access Control
  - Investigative and Operational Leads
  - Intelligence Gathering for Identity Management
  - Forensic Comparison

- Limitations:
  - Image quality/resolution/size
  - Lighting conditions
  - Distance of camera to subject
  - Image formats/compression
  - Expression/Aging/Weight Changes/Health Changes/Intentional Modifications
  - Comparisons - subjective/opinion based

Historical Scales used in Facial Identification (1 of 3)

- Screening and Access Control
  - No formalized scale used
- Investigative and Operational Leads
  - Investigative Lead
  - Inconclusive
  - Not the same person

These are examples from some agencies and were not standardized across the discipline.

- Intelligence Gathering for Identity Management
  - Example 1:
    - Identification (match)
    - Likely
    - Inconclusive
    - Unlikely
    - Non-Identification (non-match)
  - Example 2:
    - +3 Conclusion that subjects are almost certainly the same person
    - +2 Conclusion that subjects are likely the same person
    - +1 Observation of positive indications between subjects
    - 0 Determined this comparison to be inconclusive
    - -1 Observation of negative indications between subjects
    - -2 Conclusion that subjects are likely not the same person
    - -3 Conclusion that subjects are almost certainly not the same person

These are examples from some agencies and were not standardized across the discipline.

Historical Scales used in Facial Identification (3 of 3)

- Forensic Examinations (7-point scale)
  - Example 1:
    - +3 – Extremely strong support for Identification (i.e., "Identification" or "Appears to be")
    - +2 – Strong support for Identification, with little or no support for Exclusion
    - +1 – Some or Limited support for Identification, with less support for Exclusion
    - 0 – No Conclusion [The subject cannot be differentiated from a large segment of the population.]
    - -1 – Some or Limited support for Exclusion, with less support for Identification
    - -2 – Strong support for Exclusion, with little or no support for Identification
    - -3 – Extremely strong support for Exclusion (i.e., "Elimination")
  - Example 2:
    - +3: The observations strongly support that it is the same person
    - +2: The observations support that it is the same person
    - +1: The observations support to some extent that it is the same person
    - 0: The observations support neither that it is the same person nor that it is different persons
    - -1: The observations support to some extent that it is not the same person
    - -2: The observations support that it is not the same person
    - -3: The observations strongly support that it is not the same person

These are examples from some agencies and were not standardized across the discipline.

History & Limitations of VITAL

- VITAL – started to become used in the 1990's

- Limitations:
  - Image quality/resolution/size
  - Lighting conditions
  - Distance of camera to subject
  - Image formats/compression
  - Comparisons - subjective/opinion based
  - Authentication - increases in technology (automated tools, artificial intelligence)

Historical Scales used in VITAL

Continuum of Conclusions Examples For Photographic Comparative Analysis			
Identification / **No conclusion** / **Elimination**	Identification	Identification	Identification
	Similar		Powerful support same
		Similarities noted	Strong support same
			Moderate support same
	No conclusion, but with similarities		Limited support same
	No conclusion	Neither/Nor – with explanation	Inconclusive
			Limited support different
	No conclusion, but with dissimilarities		Moderate support different
			Strong support different
	Dissimilar		Powerful support different
	Elimination	Elimination	Elimination
	No comparison Possible	Not suitable – with explanation	No comparison Possible

History of Standard Guide for Image Comparison Opinions

- Document originally started in Facial Identification Subcommittee.
- Added VITAL Subcommittee to create a DM SAC Task Group
- Original version included the following:
  - Exclusion
  - Strong Support for Exclusion
  - Support for Exclusion
  - Inconclusive
  - Support for Common Source
  - Strong Support for Common Source

Timeline Standard Guide for Image Comparison Opinions

- Sept 2020 – document approved to send to SDO by DM SAC (previous OSAC process)
- May 2021 – document received negative ballots at SDO.
- June 2021 - OSAC invited documents that had gone through the previous process to go through the STRP process. The task group decided to do this.
- July 2022 – Completed STRP with mixed response
- Aug 2022 – Submitted for review in to the FSSB. Petition received
- Sept 2022 - Ballot at FSSB = failed
- Feb 2023 – Recirculation ballot at FSSB = failed*
- May 2023 – Recirculation ballot #2 at FSSB = passed
- June 2023 – Posted to the OSAC Registry as proposed standard
- July 2024 – Adjudicating negative comments at ASTM

Considerations

- Multiple Disciplines
- Framework vs Interdisciplinary Standard
- Total number of options on the scale
- Confusion surrounding original decisions in the standard
  - Original version included the following:
    - Exclusion
    - Strong Support for Exclusion
    - Support for Exclusion
    - Inconclusive
    - Support for Common Source
    - Strong Support for Common Source
- Understanding conclusion-centric vs evidence-centric

Conclusion Centric

- A statement about the truth, falsity, or probability of a claim or hypothesis
  - Statement traditionally been termed a "conclusion."
  - Typically made by a "decision-maker" (e.g., judge, jury)
    - Generally, holds only one conclusion-centric statement about a case at a time

Conclusion-Centric Opinions

- Individualize
- Individualization
- Identifies
- Identification
- Includes
- Inclusion
- Inconclusive
- Excludes
- Exclusion

Evidence-Centric

- A categorical or numerical expression for the extent to which the evidence under consideration is more probable when the same-source claim or hypothesis is true than when a different-source claim or hypothesis is true.
  - Statement of evidentiary value, weight of evidence, or support for a conclusion.
  - Typically made by a forensic scientist based on the nature of the evidence and the performance of the methods used for analysis
    - Can hold many evidence-centric statements simultaneously.

Why the confusion?

- Decision maker (conclusion-centric) vs Forensic Scientist (evidence-centric)
  - Some labs function as both the forensic scientist and the decision maker
    - Reach an opinion as a forensic scientist (based on the evidence) which then informs a decision maker (who considers other things/evidence) to reach a conclusion-centric opinion

Where did we end up?

- Evidence-Centric Scale
  - **<u>Strong Support for Different Source</u>**
    - an opinion category for which the observed dissimilar characteristics far outweigh the observed similar characteristics or where no distinctive similarities are observed. The nature and level of the observed similarities and dissimilarities in image characteristics are much more probable given the proposition that the images depict two different sources than given the proposition that the images depict the same source.

Where did we end up?

- Evidence-Centric Scale
  - **Strong Support for Different Source**
  - **Support for Different Source**
    - an opinion category that the observed dissimilar characteristics outweigh the similar characteristics but are insufficient to reach strong support for different source. The nature and level of the observed similarities and dissimilarities in image characteristics are more probable given the proposition that the images depict two different sources than given the proposition that the images depict the same source.

Where did we end up?

- Evidence-Centric Scale
  - **Strong Support for Different Source**
  - **Support for Different Source**
  - **Equal Support** *(for Common or Different Source)*
    - an opinion category that there is insufficient information to form an opinion of common source or different source. The nature and level of the observed similarities and dissimilarities in image characteristics are equally probable given the proposition that the images depict two different sources and given the proposition that the images depict the same source.

Where did we end up?

- Evidence-Centric Scale
  - **<u>Strong Support for Different Source</u>**
  - **<u>Support for Different Source</u>**
  - **<u>Equal Support (for Common or Different Source)</u>**
  - **<u>Support for Common Source</u>**
    - an opinion category that the observed similar characteristics outweigh the observed dissimilar characteristics but are insufficient to reach strong support for common source. The nature and level of the observed similarities and dissimilarities in image characteristics are more probable given the proposition that the images depict the same sources than given the proposition that the images depict the two different sources.

Where did we end up?

- Evidence-Centric Scale
  - **<u>Strong Support for Different Source</u>**
  - **<u>Support for Different Source</u>**
  - **<u>Equal Support *(for Common or Different Source)*</u>**
  - **<u>Support for Common Source</u>**
  - **<u>Strong Support for Common Source</u>**
    - an opinion category that the observed similar characteristics far outweigh the observed dissimilar characteristics. The nature and level of the observed similarities and dissimilarities in image characteristics are much more probable given the proposition that the images depict the same sources than given the proposition that the images depict the two different sources.

Where did we end up?

- Evidence-Centric Scale
  - **Strong Support for Different Source**
  - **Support for Different Source**
  - **Equal Support** *(for Common or Different Source)*
  - **Support for Common Source**
  - **Strong Support for Common Source**

Interlaboratory Study

- NIST grant to North Carolina State University
- Comparisons related to OSAC VITAL (clothing and hands) and FII (face) subcommittees
- Sent to:
  - Laypersons (100)
    - Forensic practitioners not trained in image comparisons
    - Forensic science undergraduate/graduate students
    - General public
  - Forensic practitioners (60) determined competent by respective agency/organization in face, hand, or clothing image comparisons
    - Face practitioner (30)
    - Clothing practitioner (16)
    - Hand practitioner (15)
- 20 image pairs of carrying source and difficulty

Interlaboratory Study

- Surveys returned to date - *There's still time to complete!*
  - Face practitioner – 20 (66%)
  - Clothing practitioner – 9 (56%)
  - Hand practitioner – 8 (53%)

- Limitations of the study
  - Downloading of images not allowed

- Results late Fall/early Spring
  - Expect a presentation at next year's IAI conference!

Future Development

- Development of discipline specific standards
  - Interlab Study will help inform
- Push towards likelihood ratios
  - Does not have to be based on numbers!

Act and Make an Impact!

Participate in OSAC's 2024 Registry Implementation Open Enrollment Event

July 8 Through September 2

September 15 Through 21

Visit booth #322 for more info!

Questions

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