

Latent Fingerprint Processing

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Contributors



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Objectives/Rationale

- × Study case processing of latent prints in large lab (HFSC)

- × First, gather basic information about case flow:

 - Frequency of verifications

 - Frequency with which verifications lead to changes in original examiners' conclusions

 - Frequency of conflict resolution

 - Examiner differences

- × Later, study potential interventions, e.g.:

 - Implementation of blind verification

 - Blinding analysts to task-irrelevant information

 - New procedures for conflict resolution



Baseline, descriptive data:

- × Illustrative data regarding case flow
 - ⊙ Such basic data is important, but rarely accessible
- × Provides a baseline for comparison:
 - ⊙ With post-intervention changes at this lab
 - ⊙ With procedures at other labs
- × Provides an illustration of self-study (replicable in other labs):
 - ⊙ Rates of verifications and outcomes,
 - ⊙ Examiner differences and conflict resolution,
 - ⊙ Etc.

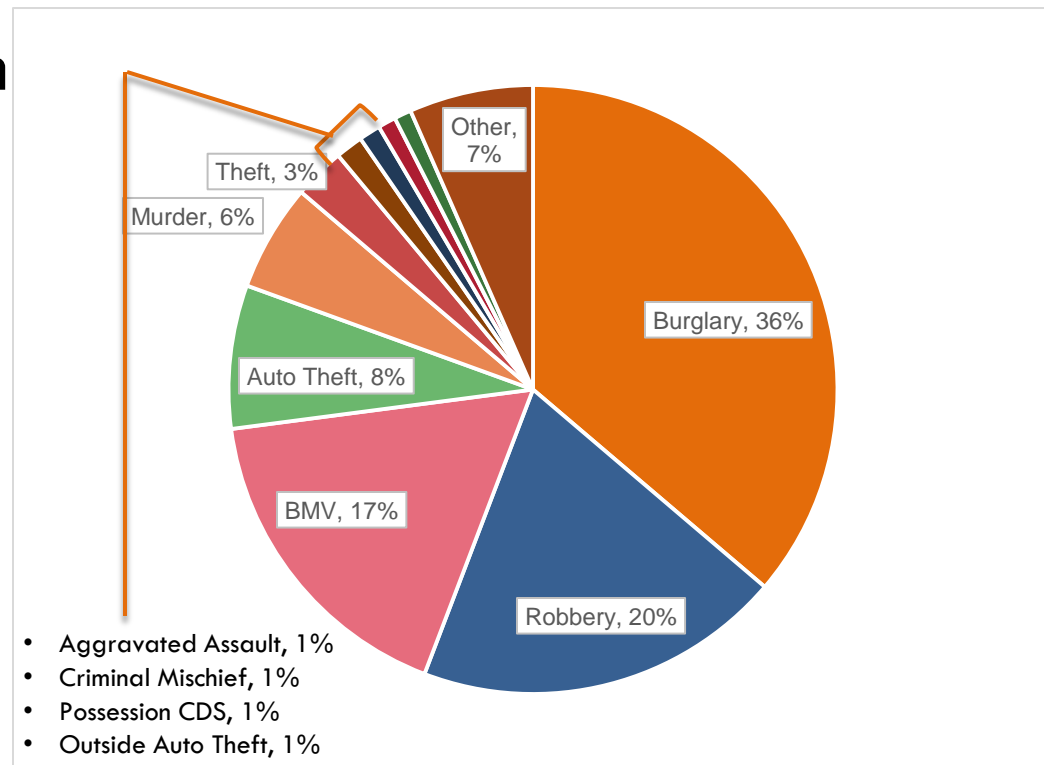


CASE VOLUME AND INITIAL DECISIONS



Case Volume and Offense Type

- × Case processing data over **2 Years**
- × Total Number of Cases: **2,536**
- × Offenses Range from Shoplifting to Capital Murder

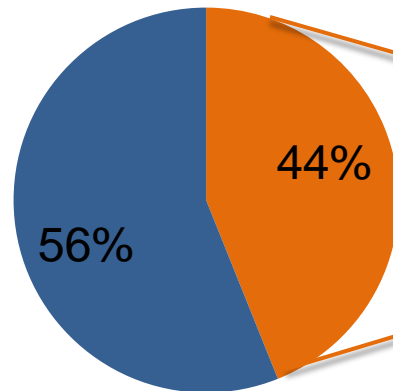


Latent Prints Across 2,536 Cases

- × Total Number of Latent Prints Analyzed: **12,363**
- ⊙ Total Number of Latent Prints of Value: **5,430**

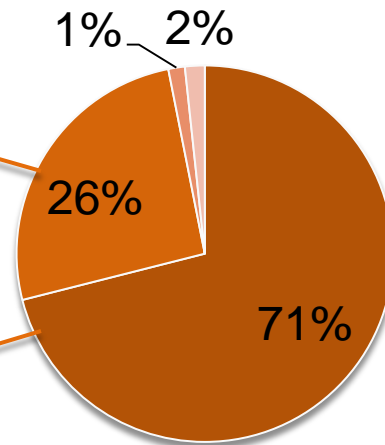
Relative Proportion of Value and No Value Prints

■ Prints of Value
■ Prints of No Value

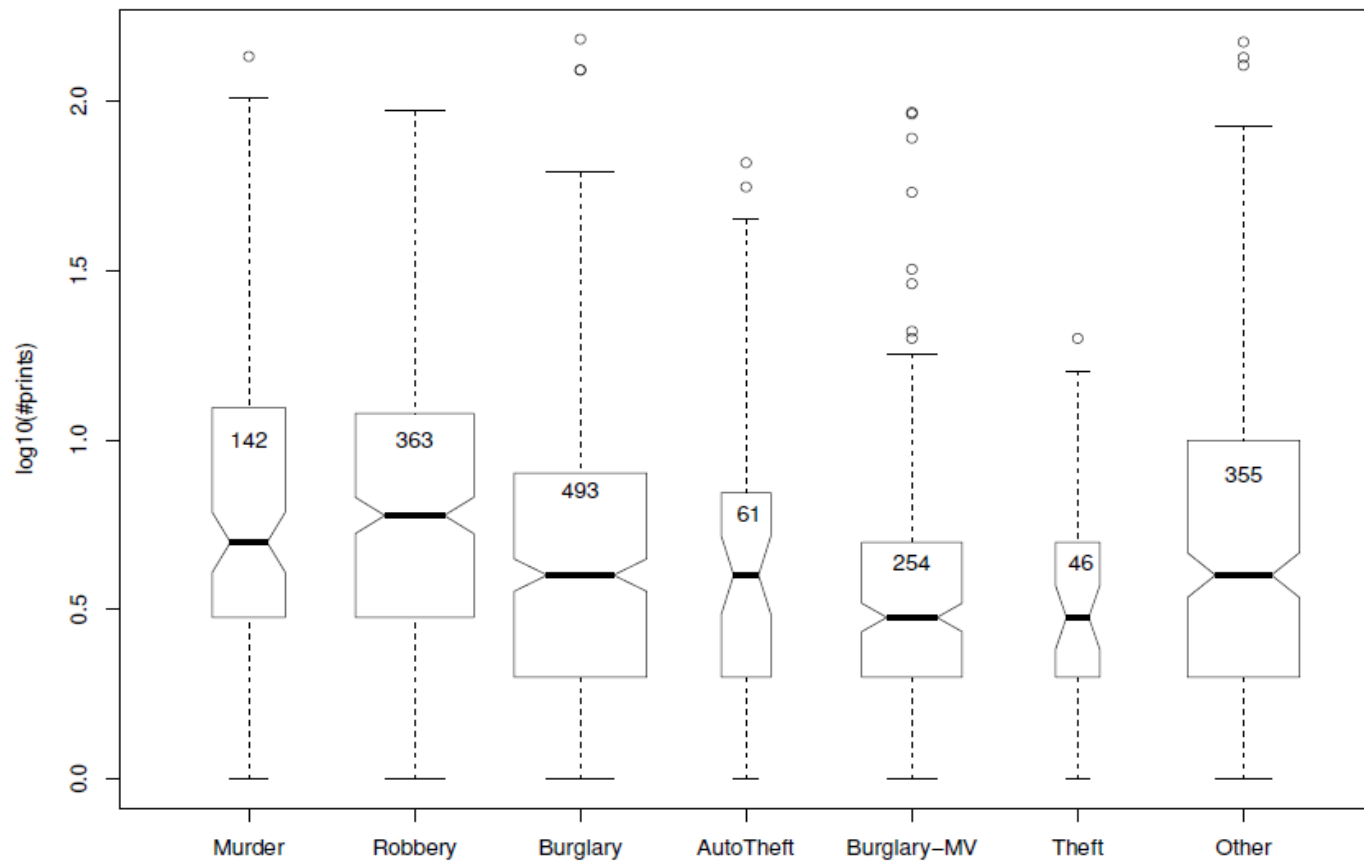


Prints of Value by Type

■ Fingerprints
■ Palm Prints
■ Joint Imp
■ Other Imp



Latent Prints by Offense Type



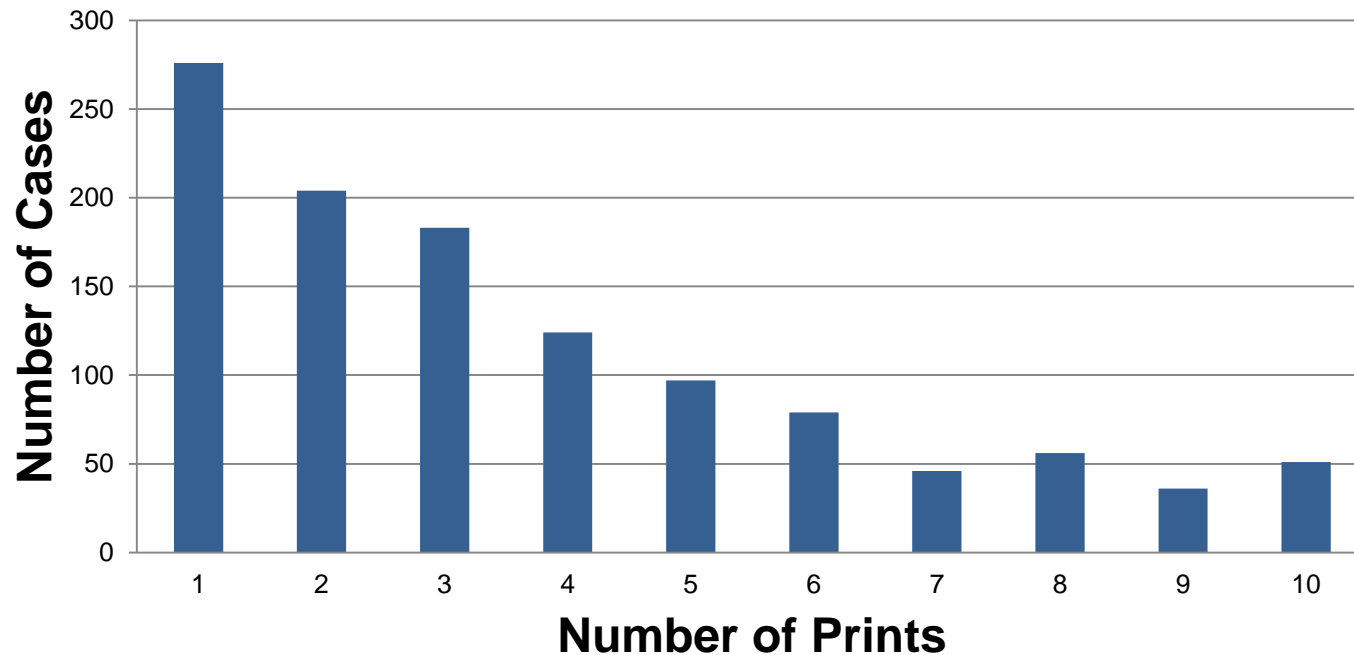
Distribution of Latent Prints Across Cases

× Range: **1-153** prints

⊙ Mean: **8.50**

Median: **4.00**

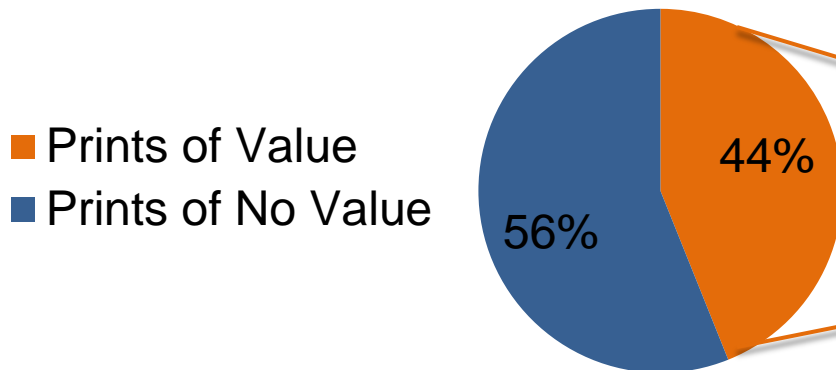
Mode: **1**



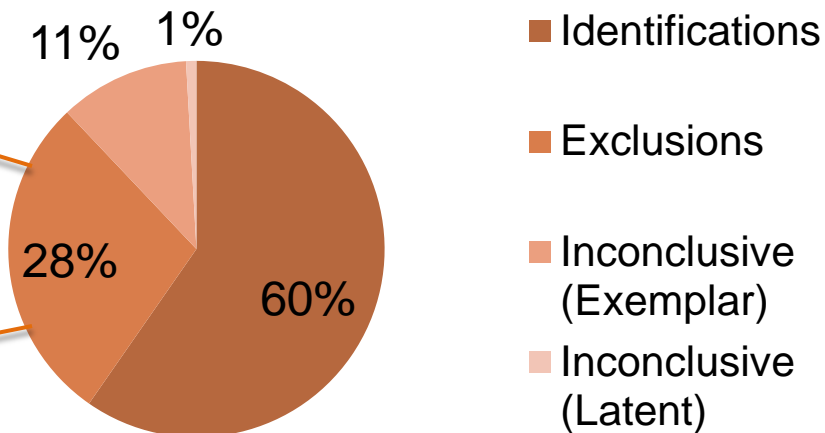
Initial Examiner Decisions for Latents of Value

× **N = 12,363 Latent Prints**

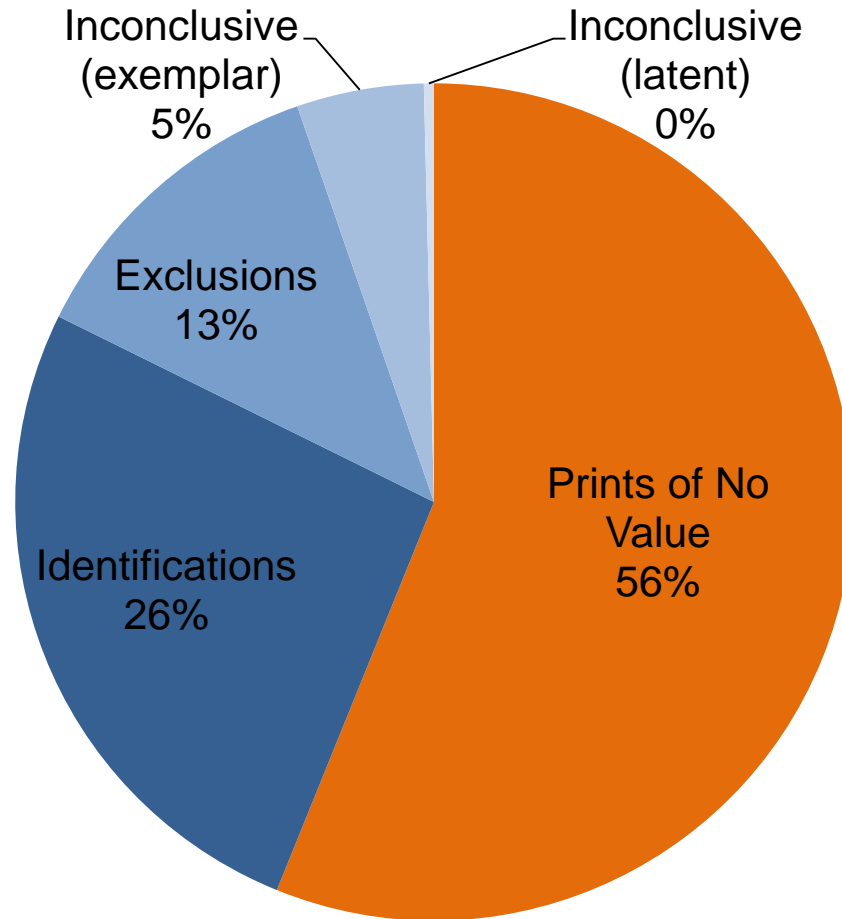
Relative Proportion of Value and No Value Prints



Decisions About Latents of Value



Overall Decisions



VERIFICATION AND CONSULTATION



Verification Policy

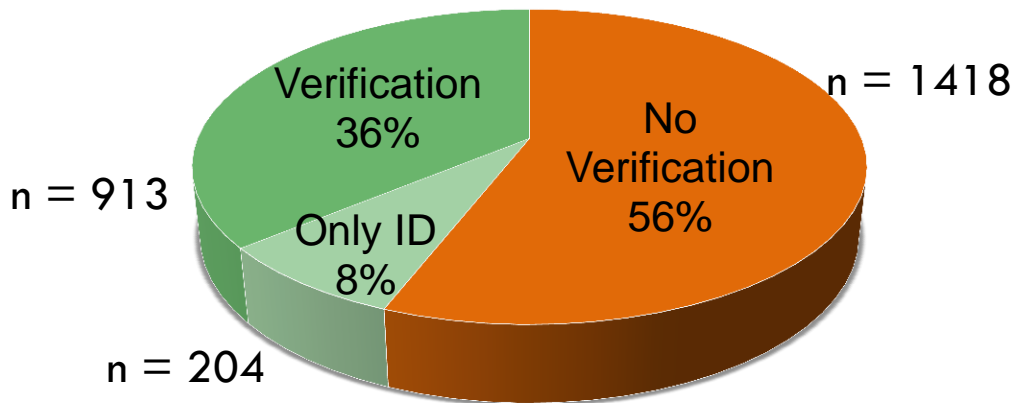
- × Primarily based on offense type
- × Generally:
 - ⊙ Violent Offenses: All decisions verified
 - ⊙ Property Offenses: Only identifications verified

Verification and Consultation

N = 2,536 Cases

3% of all cases proceed to Consultation

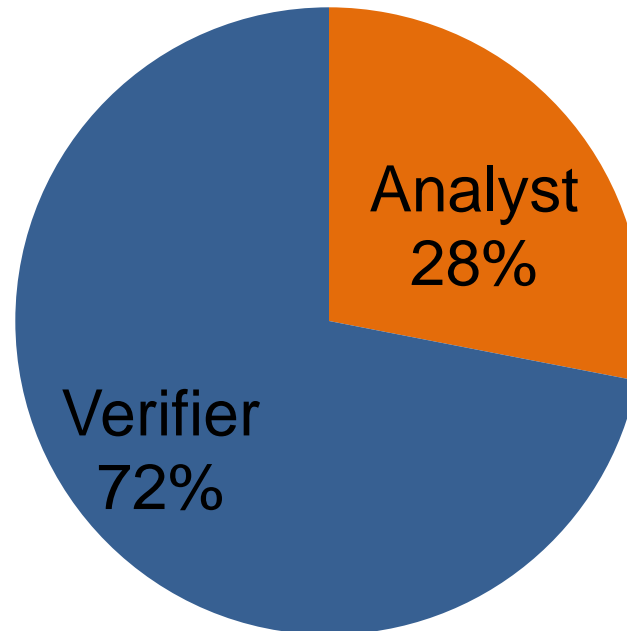
7% (n = 82) of cases that have been verified proceed to Consultation



- → During Verification, analysts agree **93%** of the time

Results of Consultation

- × 82 cases, 132 prints
- × Final decisions are typically those of the **verifier** as opposed to original analyst



Post-Consultation Decisions: Value/No Value

Conclusion	Frequency	Conclusion Changed During Consultation
Latent of No Value → Latent of Value	18	Yes
Latent of Value → Latent of No Value	14	Yes
Latent of Value Remains	8	No
Latent of No Value Remains	3	No

Post-Consultation Decisions: Identification/Inconclusive/Exclusion

Conclusion	Frequency	Conclusion Changed During Consultation
Exclusion → Identification	22	Yes
Exclusion → Inconclusive	15	Yes
Identification → Inconclusive	14	Yes
Identification Remains (vs. Inconclusive)	13	No
Inconclusive → Identification	12	Yes
Inconclusive → Exclusion	10	Yes
Inconclusive Remains (vs. Identification)	2	No
Exclusion Remains (vs. Inconclusive)	1	No

CONFLICT RESOLUTION



Conflict Resolution

x 8 Cases, 10 prints

Conclusion	Frequency	Conclusion Changed During Conflict Resolution
Latent of Value → Latent of No Value	2	Yes
No Value Remains	2	No
Identification → Inconclusive	1	Yes
Identification Remains (vs. Inconclusive)	1	No
Inconclusive → Identification	2	Yes
Inconclusive Remains (vs. Identification)	1	No
Exclusion Remains (vs. Inconclusive)	1	No

EXAMINER DIFFERENCES



Examiner Differences

x 12 Examiners Total

Domain	Range
Years of Experience	6-28
Cases Verified	29-141 36-63%
Consultations	3-23 1-11%
Decisions Changed During Consultation	1-22 33-95%
Conflict Resolution	0-2 (Mode = 0)

Conclusions

Baseline Data → Relevant for comparisons:

- To other labs
- Post-Intervention
 - E.g., Blind Verifications

Verification Procedures

Individual differences

- Emphasis on processes that result in individual differences
- Intersection with print quality and human factors research

More data are needed!