

# **Structured Residual Patterns Across Modalities After Constraint-Based Filtering**

**Daniel H. Kegley**  
**holstonia-investigations.org**

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## **Abstract**

Analyses of anomalous biological reports often stall after enumerating sources of error, bias, and misinterpretation. Hoaxing, cultural transmission, misidentification, and modality-specific failure modes are invoked sequentially until no material appears to remain. This paper examines whether such filtering necessarily collapses the report corpus to noise, or whether structured residual patterns persist after conservative application of multiple explanatory filters. Treating reports as metadata rather than testimony, the analysis evaluates cross-modal persistence, constraint-bound recurrence, and pattern stability as indicators of informational residue. The goal is not to infer organismal identity, but to determine whether the remaining structure warrants continued analytical attention.

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## **1. Introduction: The “Nothing Left” Assumption**

A common endpoint in skeptical evaluations of anomalous biological reports is the assertion that once known sources of error are accounted for, nothing meaningful remains. In this view, filtering functions as elimination rather than refinement: each explanatory mechanism removes a portion of the data until the remainder is dismissed as irreducible noise.

This paper challenges that assumption. In many scientific domains, aggressive filtering does not erase signal but reveals it by stripping away confounds (MacKenzie et al., 2006). The relevant question is therefore not whether reports survive filtering intact, but whether **patterned structure persists** after conservative constraints are applied across modalities.

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## 2. Reports as Metadata, Not Testimony

The analytical stance adopted here treats individual reports as **metadata points** rather than as truth claims. A report contributes information about timing, location, modality, observer context, and descriptive features, regardless of whether the underlying interpretation is correct.

This approach parallels methods used in ecology, epidemiology, and the study of rare events, where imperfect observations are aggregated to detect structure under uncertainty (MacKenzie et al., 2006). Evaluative focus shifts from adjudicating credibility to examining **distributional properties**.

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## 3. Filtering Does Not Mean Deletion

Filtering mechanisms—hoaxing, cultural transmission, misidentification, and modality-specific limits—are often misunderstood as disqualifiers. In practice, they function as **weights** rather than switches.

Each filter:

- reduces confidence in certain features,
- down-weights particular modalities under specific conditions,
- and narrows the range of plausible interpretations.

Filtering removes overinterpretation, not data. When applied conservatively, it increases the signal-to-noise ratio rather than driving it to zero (Nickerson, 1998).

## 4. Cross-Modal Persistence as an Indicator of Residual Structure

One of the strongest indicators that something remains after filtering is **cross-modal persistence**. Patterns that appear independently across different evidence types—audio, tracks, visual reports—are less likely to be artifacts of any single failure mode.

Each modality has distinct vulnerabilities:

- audio to misidentification and psychoacoustic bias,
- tracks to substrate distortion and taphonomy,
- visual media to detection limits and expectation effects.

Residual features that recur across modalities therefore merit attention, even when none is decisive alone.

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## 5. Constraint-Bound Recurrence

Residual patterns are most informative when they recur **within known constraints** rather than violating them. Constraint-bound recurrence refers to features that persist while respecting:

- environmental limits (habitat, terrain),
- temporal structure (seasonality, time of day),
- observational constraints (distance, lighting, duration).

Such recurrence differs from unconstrained novelty, which is more compatible with noise or narrative drift (Allport & Postman, 1947).

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## 6. Stability Over Time Without Escalation

Another indicator of residual structure is **long-term stability without inflation**. Cultural transmission and hoaxing tend to amplify and elaborate features over time. Residual patterns, by contrast, often remain frustratingly consistent or even diminish in clarity.

This persistence without escalation is analytically counterintuitive but methodologically important. It suggests constraint rather than embellishment and aligns with observations in folklore studies where core motifs remain stable while peripheral details drift (Dégh, 2001).

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## 7. Geographic Patterning Beyond Population Density

Purely sociocultural explanations predict strong alignment between report frequency and human population density. While such alignment exists, residual structure is suggested when geographic clustering persists after accounting for observer effort and accessibility.

Patterns that correlate with habitat features rather than purely with population centers warrant further examination, even under conservative assumptions (MacKenzie et al., 2006).

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## 8. What Residuals Do *Not* Tell Us

It is essential to specify what residual patterns do **not** establish. They do not:

- identify an organism,
- validate eyewitness interpretations,
- justify extraordinary claims,
- or resolve ontological questions.

Residual structure indicates **incompleteness of explanation**, not correctness of any particular hypothesis. Treating residuals as proof would reverse the logic of conservative inference.

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## 9. Residuals as a Research Signal

In many scientific contexts, residuals motivate further investigation rather than immediate conclusion. Unexplained variance has historically driven advances in fields ranging from astronomy to ecology.

Here, residual patterns function similarly: as signals that existing models may be incomplete or insufficiently parameterized. The appropriate response is improved study design, not speculative inference (MacKenzie et al., 2006).

## 10. Avoiding the Residual Fallacy

A common error is to assume that whatever survives filtering must be extraordinary. This **residual fallacy** confuses absence of explanation with presence of anomaly.

Avoiding this fallacy requires maintaining asymmetry: filters remove unjustified certainty, but residuals justify only **continued analysis**, not belief (Kahneman, 2011).

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## 11. Integrating Residual Analysis Across Papers

The preceding papers have progressively constrained major explanatory pathways:

- bears and known fauna,
- hoaxing as structured behavior,
- cultural transmission and narrative drift,
- audio, track, and visual modality limits.

Residual analysis integrates these constraints, asking not what explains everything, but what fails to explain everything **without overreach**.

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## 12. Synthesis: Why Something Can Remain Without Knowing What It Is

After conservative filtering, the report corpus is diminished but not erased. What remains is structured uncertainty: patterned, constrained, and unresolved.

Such structure justifies continued methodological engagement while forbidding premature conclusions. This posture neither affirms nor denies the existence of anomalous organisms. It acknowledges that the data, treated rigorously, have not yet collapsed to noise.

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## 13. Implications for Research Design

Residual patterns inform where effort should be concentrated, which variables require better control, and which modalities warrant integration. Subsequent papers formalize research design principles for working within this uncertainty, emphasizing replication, standardization, and ethical restraint.

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## References

Allport, G. W., & Postman, L. (1947). *The psychology of rumor*. Henry Holt.

Dégh, L. (2001). *Legend and belief: Dialectics of a folkloric genre*. Indiana University Press.

Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.

MacKenzie, D. I., Nichols, J. D., Royle, J. A., Pollock, K. H., Bailey, L. L., & Hines, J. E. (2006). *Occupancy estimation and modeling*. Academic Press.

Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2(2), 175–220.

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