Percussive Claims in Field Reports: Evaluating Wood Knocks, Rock Clacks, and Knock-Response Interpretations Under Constrained Inference

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Abstract

Reports of percussive sounds—commonly described as "wood knocks" and "rock clacks"—occupy a prominent role in North American Bigfoot field narratives. Of particular interest are accounts in which an investigator produces a percussive impulse and shortly thereafter perceives a similar sound interpreted as a responsive signal. Such reports are often taken to imply intentional agency, tool selection (e.g., curated sticks or stones), and strategic use of acoustically favorable substrates. This paper evaluates percussive claims using a constrained-inference framework that distinguishes what such sounds may plausibly indicate from what they cannot establish on their own. Drawing on comparative primate ethology, bioacoustics, and psychoacoustics, the analysis considers known nonvocal percussive signaling in primates, wildlife and environmental confounds, and observer-generated physiological sound mechanisms. Emphasis is placed on falsifiable predictions and field protocols capable of discriminating among competing hypotheses. The goal is not to adjudicate species attribution, but to establish evidentiary ceilings and methodological pathways for treating percussive reports as analyzable data rather than anecdote.

1. Introduction

Percussive anomalies—sharp, impulse-like sounds attributed to impacts on wood or stone—are among the most frequently cited auditory indicators in Bigfoot field investigations. These sounds are often reported as occurring in discrete bouts or as apparent "responses" to investigator-initiated percussive actions. Within informal interpretive frameworks, such events are sometimes treated as evidence of communicative intent, technological competence (use or transport of tools), and spatial awareness by an unseen agent.

A constrained-inference approach treats such interpretations as hypotheses rather than conclusions. The central analytical question is not whether percussive sounds are unusual—forested environments routinely generate impulse noises—but whether specific percussive events support inferences beyond their immediate acoustic properties. This paper evaluates the inferential structure surrounding percussive claims by asking: **what classes of mechanisms are capable of producing the reported sounds, what predictions follow from each mechanism, and what data are required to discriminate among them?**

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2. Why Percussive Sounds Are Persuasive—and Methodologically Risky

Percussive sounds carry disproportionate interpretive weight in field contexts for several well-documented reasons:

1. **Poor localization in complex environments.**
   Forested terrain introduces reverberation, scattering, and direction-of-arrival ambiguity. Short, broadband impulses are especially difficult to localize accurately without instrumentation, increasing the likelihood of distance compression or directional error (Rhinehart et al., 2020).
2. **Psychological salience of contingency.**
   When a sound occurs shortly after an observer's action, causal attribution is often inferred even when coincidence or third-party generation is plausible.
3. **High environmental base rate.**
   Branch falls, wood-on-wood contact, rock movement, and wildlife activity regularly produce impulse-like sounds. Without baseline quantification, distinguishing anomalous from ordinary percussives is unreliable.

These factors do not invalidate percussive reports, but they substantially lower the inferential ceiling unless recordings and spatial data are available.

3. Comparative Ethology: Nonvocal Percussive Signaling in Primates

Nonvocal percussive signaling is well documented in primate research. Wild chimpanzees engage in **buttress drumming**, striking resonant tree structures to produce low-frequency signals capable of long-distance propagation (Boesch, 1998; Eleuteri et al., 2022). Importantly, this behavior exhibits **substrate selectivity**: certain tree species and structural forms are preferentially used due to their acoustic properties (Fitzgerald et al., 2022; Wilhelm et al., 2024; Woods et al., 2019).

In addition to wood-based percussion, chimpanzees have been observed engaging in **stone-associated percussive behaviors**, including repeated stone impacts against trees and the accumulation of stones at specific locations (Kühl et al., 2016; van Loon et al., 2025). While interpretations of these behaviors remain debated, they demonstrate that percussive tool use is within the known behavioral repertoire of large-bodied primates.

Constrained inference from this literature:
Percussive signaling involving substrate or tool selection is biologically plausible in principle. However, the empirical record emphasizes patterned behavior, repeated site use, and measurable acoustic advantages—criteria that must be met before analogous interpretations can be extended to other contexts.

4. Competing Hypotheses for Percussive and "Knock-and-Response" Events

Percussive reports, including apparent responses to investigator-initiated sounds, can be evaluated under several competing hypotheses, each generating distinct, testable predictions.

H1: Responsive agency employing wood or stone percussion

Predictions:

- Recorded impulses exhibit consistent spectral and temporal characteristics across events.
- Sounds localize repeatedly to specific external features (trees, rock faces).

- Multi-recorder timing supports a coherent external source location.

H2: Human-generated percussives

Predictions:

- Source localization aligns with trails, camps, roads, or known human access points.
- Occurrence correlates with periods of human activity.

H3: Wildlife-generated percussive sounds

Numerous species generate impulse-like sounds, particularly woodpeckers whose drumming varies by species and season (All About Birds, 2025; Audubon, 2018).

Predictions:

- Temporal patterning corresponds to known species-specific rhythms or seasonal peaks.
- Spectral signatures show repetitive biological structure rather than arbitrary impacts.

H4: Environmental impulse sources

Wind-driven branch contact, deadfall, freeze–thaw processes, and rock movement can produce sharp transients.

Predictions:

- Occurrence correlates with meteorological conditions or unstable terrain.
- Source locations cluster around deadwood, slopes, or ravines.

H5: Observer-generated physiological sound mechanisms

Certain human actions and physiological processes can generate impulse-like sounds without conscious intent.

Candidate mechanisms:

- Cupped-hand claps producing cavity-resonant impulses (Papadakis et al., 2020; Fu et al., 2025).
- Tongue clicks used in human echolocation, with measurable acoustic signatures (Zhang et al., 2017; De Vos & Hornikx, 2017; Norman & Thaler, 2018).
- Temporomandibular joint clicks producing audible transients (Widmalm et al., 1996; Gay et al., 1988).

Predictions:

- Events recur disproportionately under conditions of fatigue, cold, dehydration, heightened concentration, or stress.
- Sounds may be perceived as asymmetrically lateralized or extremely near the observer.
- Body-mounted microphones record the transient at substantially higher amplitude than spatially distributed environmental recorders.

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5. Localization as the Central Analytical Constraint

Without source localization, percussive events cannot support strong inference. Fortunately, impulse localization is a well-developed problem in bioacoustics. Time-Difference-of-Arrival (TDOA) methods using spatially distributed autonomous recorders are routinely employed to localize wildlife sounds in complex soundscapes (Rhinehart et al., 2020; Lellouch et al., 2025). Comparable methods exist for impulsive acoustic events using distributed microphone arrays (Mišković et al., 2022).

Even modest recorder arrays can distinguish between near-observer, local environmental, and distant sources, dramatically reducing interpretive ambiguity.

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6. A Constrained-Inference Ladder for Percussive Evidence

To maintain proportional claims, percussive observations can be placed on an evidentiary ladder with explicit inferential ceilings:

- **Level 0:** Unrecorded auditory report
  Inference ceiling: a sound was perceived.
- **Level 1:** Single-channel recording
  Inference ceiling: acoustic event exists; basic temporal and spectral description.

- **Level 2:** Multi-channel recording with spatial separation
  Inference ceiling: source localization constraints; rejection of near-observer artifacts.
- **Level 3:** Controlled stimulus comparisons with array capture
  Inference ceiling: discrimination among candidate mechanisms.
- **Level 4:** Repeated site-specific events with consistent substrates and localization
  Inference ceiling: strongest non-identifying evidence for intentional signaling behavior.

This framework prevents escalation of claims beyond what the data support.

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7. Field Protocol for Evaluating Percussive Claims

A minimally sufficient protocol for treating percussive events as analyzable data includes:

1. Deployment of three or more spatially separated recorders suitable for TDOA analysis.
2. Precise logging of all investigator-initiated percussive actions.
3. Creation of a local calibration library capturing known percussive and physiological sound exemplars.
4. Suspension of immediate reactive behavior following unanticipated impulses to preserve baseline recording.
5. Post-hoc localization and signature comparison analyses.

This approach yields informative results regardless of outcome.

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8. Discussion: Inferring Tool Use and Substrate Selection

Claims that percussive events imply curated tools or resonant-substrate exploitation require evidence of repeated, site-specific use and measurable acoustic advantages. Comparative primate research demonstrates that such inferences are warranted only when behavior is patterned, localized, and persistent (Wilhelm et al., 2024; Woods et al., 2019). Absent these features, percussive reports remain compatible with wildlife, environmental, or observer-generated explanations.

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9. Conclusion

Percussive sounds are compelling but methodologically hazardous indicators in field investigations. While comparative ethology establishes the plausibility of nonvocal percussive signaling among primates, forests present numerous confounds, and human physiological mechanisms can generate impulse-like sounds that are easily misattributed. The principal credibility gain lies not in interpretive argument, but in instrumentation and constrained inference. Distributed recording arrays and localization analysis provide a practical pathway for transforming percussive claims from anecdote into testable observations with explicit evidentiary limits.

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