

Graphic Score Interpretation Ecology (GSIE): Modelling Distributed Creativity in Contemporary Sound Practice

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Abstract

This article proposes Graphic Score Interpretation Ecology (GSIE) as a framework for analysing interpretation in graphic-score-based sound practice. Drawing on the DAILY project, in which nineteen participants produced distinct works from the same set of graphic scores, the study addresses a central problem: how meaning emerges when notation does not prescribe outcome. Rather than treating interpretation as a process of decoding, GSIE models it as a dynamic system involving visual, embodied, cultural, technological, and creative dimensions. The paper argues that graphic scores function as generative systems that organise conditions for distributed creativity. This perspective contributes to sound-based artistic research by providing a framework for understanding variability, interaction and knowledge production in contemporary compositional environments.

Keywords

Graphic scores; interpretation; artistic research; ecology; indeterminacy; performance studies; creative practice

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1. Introduction

Graphic scores occupy a critical position in the development of experimental and sound-based practices by replacing prescriptive notation with visual abstraction, thereby destabilising the assumption that musical meaning can be encoded and transmitted in fixed form. While this condition has often been discussed in relation to indeterminacy and performer agency, a key question remains insufficiently addressed: how can interpretation be understood and analysed when sonic outcomes are structurally open?

This article approaches this question by reconsidering the status of interpretation itself. Rather than treating interpretation as the realisation of a pre-existing work, it proposes that interpretation operates as a dynamic and constitutive process through which sonic forms emerge. To account for this shift, the article introduces Graphic Score Interpretation Ecology (GSIE) as a framework for modelling interpretation as a system of interactions across multiple domains.

2. Literature Review

2.1 Graphic Scores and Indeterminacy

Graphic scores emerged in the mid-twentieth century as part of a broader shift toward indeterminacy in music. Composers such as John Cage, Earle Brown, and Cornelius Cardew challenged the authority of fixed notation by introducing open forms and visual representations that resist precise decoding.

Cage's concept of indeterminacy reframed composition as a process that allows for variability and contingency (Cage 1961). Similarly, Brown's open-form works enabled performers to reorganise musical structures in real time, while Cardew's *Treatise* (1967) exemplifies the use of abstract visual language as a non-prescriptive score.

Scholars have interpreted these practices as decentralising authorship and expanding performer agency (Pritchett 1993; Nyman 1999). However, much of this literature remains focused on historical development and aesthetic description rather than systematic analysis of interpretive processes.

2.2 Interpretation and Performer Agency

Studies in performance theory have increasingly emphasised the active role of performers in shaping musical meaning. Rather than acting as neutral transmitters, performers engage in interpretive decision-making informed by embodiment, training, and context (Clarke 2005; Cook 2013).

In the context of experimental and graphic notation, performer agency becomes even more pronounced. Research has shown that performers construct meaning through interaction with notation rather than through faithful reproduction (Saunders 2009).

Nevertheless, existing frameworks often lack the conceptual tools to account for the complex interactions among perceptual, cultural, and technological factors that shape interpretation in graphic-score contexts.

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2.3 Ecological Approaches to Perception and Practice

Ecological theories, particularly those developed by James J. Gibson, offer a useful alternative to representational models. Gibson's concept of affordances describes how perception is shaped by actionable possibilities within an environment (Gibson 1979).

This perspective has been extended in anthropology and artistic research by scholars such as Tim Ingold, who emphasises processes of making and interaction over static objects (Ingold 2013). Rather than viewing meaning as pre-given, ecological approaches understand it as emerging through engagement.

Applications of ecological thinking in music studies have begun to explore listening, performance, and environment as interconnected systems (Clarke 2005). However, these approaches have not yet been fully integrated into the study of graphic-score interpretation.

2.4 Artistic Research and Knowledge Production

The field of artistic research has foregrounded the idea that artistic practice can produce knowledge. Borgdorff (2012) argues that knowledge in the arts is embodied, situated, and processual rather than purely discursive.

Similarly, Nelson (2013) emphasises practice-as-research as a methodological framework in which creative work constitutes both process and outcome. These perspectives challenge traditional distinctions between theory and practice.

While artistic research provides a strong foundation for understanding practice-based knowledge, there remains a need for specific models that explain how such knowledge emerges in particular artistic systems, such as graphic-score interpretation.

2.5 Positioning GSIE

Building on these strands of research, Graphic Score Interpretation Ecology (GSIE) addresses a key gap: the lack of an integrative framework that explains how meaning and knowledge emerge through the interaction of multiple factors in graphic-score practice.

GSIE extends:

- indeterminacy theory by specifying mechanisms of variability
- performance theory by modelling multi-dimensional interaction
- ecological theory by applying it to artistic interpretation
- artistic research by formalising knowledge production processes

In doing so, GSIE offers a relational and system-oriented model that moves beyond both representational and purely descriptive approaches.

3. Methodology and Project Context

3.1 Practice-Based Design

The research adopts a practice-based methodology in which artistic production functions as both method and analytical material. Rather than testing hypotheses, the project generates conditions for observing interpretive behaviour.

3.2 The DAILY Project

The project comprises three graphic scores (*Dawn*, *Noon*, and *Moonlight*), distributed to nineteen participants. Instructions were deliberately kept to a minimum, enabling variability in instrumentation, technological configuration, and compositional strategy.

3.3 Dataset

The resulting corpus includes nineteen audio works, representing distinct interpretive responses to the same visual material.

3.4 Analytical Strategy

The analysis is concerned with recurring interpretive tendencies, divergences in sonic structure, and the relationships between visual features and compositional decisions. Within this framework, variability is understood as a primary analytical resource rather than as noise.

4. Graphic Score Interpretation Ecology (GSIE)

GSIE models interpretation as a system composed of five interacting domains.

To clarify the structure of GSIE as a system of interacting domains, Figure 1 provides an overview of the proposed framework.

Graphic Score Interpretation Ecology (GSIE)

A Dynamic System of Artistic Knowledge Production

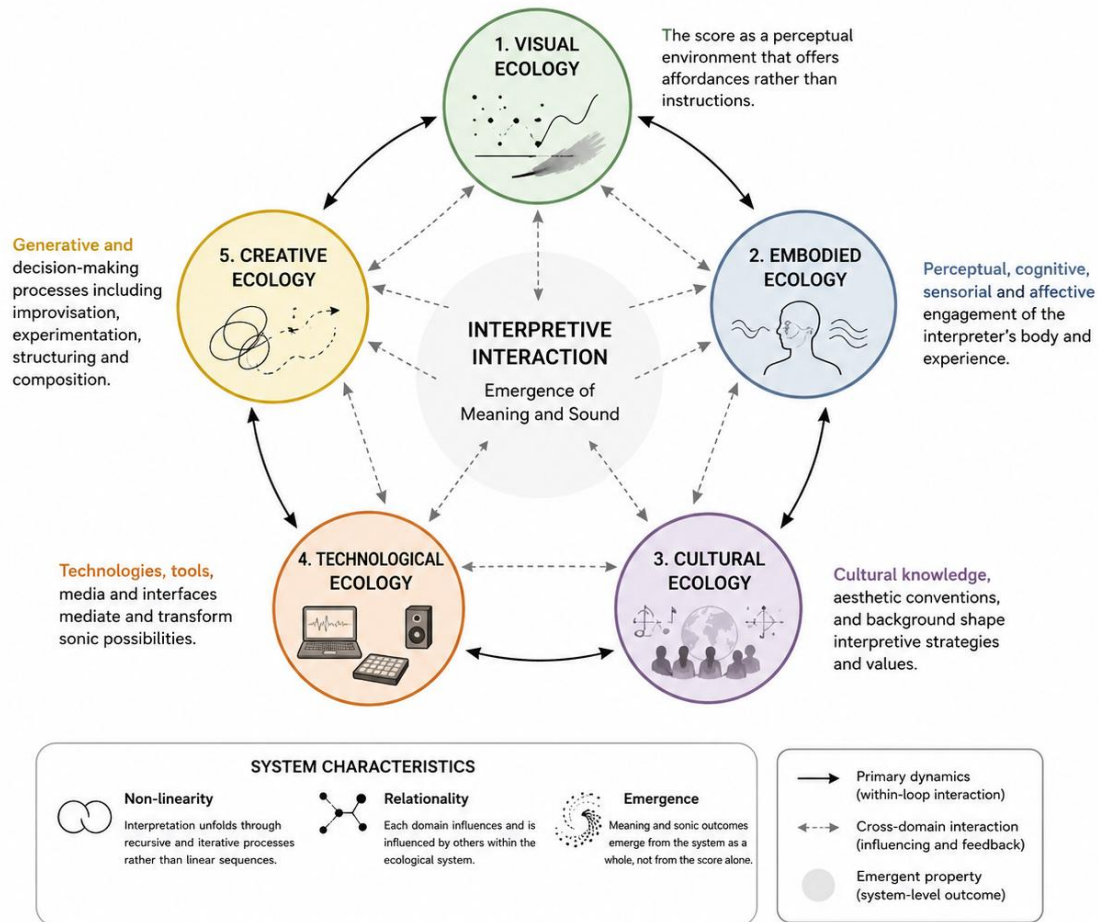


Figure 1. The Graphic Score Interpretation Ecology (GSIE) framework. Interpretation emerges from the dynamic interaction among five ecological domains. The system is non-linear, relational, and generative.

Figure 1. The Graphic Score Interpretation Ecology (GSIE) Framework

This figure presents the conceptual structure of GSIE as an ecological system composed of five interacting domains: visual, embodied, cultural, technological, and creative. Rather than operating as a linear sequence, these domains form a dynamic network in which interpretation emerges through reciprocal interactions across perceptual, contextual, and material conditions.

4.1 Visual Domain

The score operates as a field of affordances. Elements such as density, spatial arrangement and symbolic form suggest possibilities without determining outcomes.

4.2 Embodied Domain

Interpretation is shaped by perception, gesture and sensory engagement. These factors influence how visual information is translated into sound.

4.3 Cultural Domain

Background, training and aesthetic orientation inform interpretive decisions, producing distinct compositional logics.

4.4 Technological Domain

Technologies are not neutral tools but active agents in shaping sound production. Digital systems, software and interfaces expand and constrain possibilities.

4.5 Creative Domain

Interpretation involves generative processes including improvisation, structuring and iteration. These processes transform visual input into emergent sonic forms.

Figure 1 outlines the conceptual structure of GSIE as a system of interacting ecological domains. However, as a static model, it does not in itself demonstrate how interpretative processes unfold in practice. To address this, Figure 2 provides a schematic illustration of the framework in operation.

Building on the relationships defined in Figure 1, the example in Figure 2 traces how a shared graphic score gives rise to divergent sonic outcomes through dynamic interactions across visual, embodied, cultural, technological, and creative domains. This illustration is not intended as a full case study, but rather as an operational demonstration of how GSIE can be used to account for variation in interpretation. A more detailed analytical application of the framework will be developed in subsequent work.

To clarify the conceptual structure of GSIE, Figure 2 provides a preliminary illustration of how interpretative outcomes may diverge from a shared graphic score. Rather than constituting a full case study, this example is intended to outline the types of interactions and transformations that the framework is designed to capture. A more detailed and systematic analysis of such processes will be developed in a subsequent study.

Figure 2. Case Study: From Graphic Score to Sonic Outcomes through GSIE

Example: Interpretations of the score *Dawn* (Section 1 excerpt)

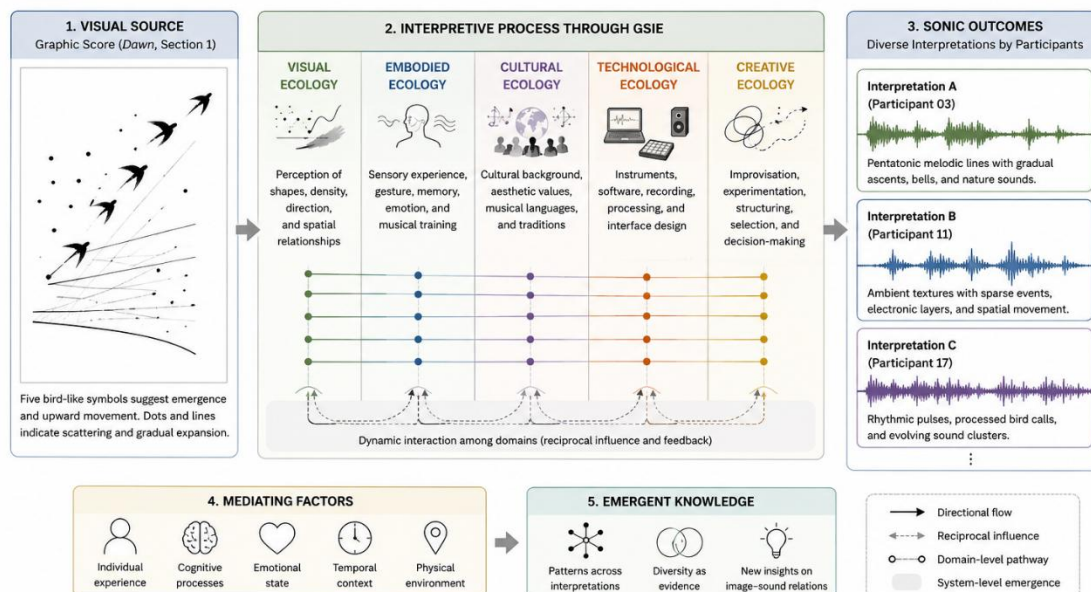


Figure 2 illustrates how a graphic score (*Dawn*, Section 1) is interpreted through the five ecological domains of the GSIE framework, leading to diverse sonic outcomes. Interpretation is shaped by dynamic interactions among visual, embodied, cultural, technological, and creative factors, mediated by individual and contextual variables. Knowledge emerges through comparison of multiple interpretations, revealing patterns and expanding understanding of image-sound relationships.

Figure 2. From Graphic Score to Sonic Outcomes: An Operational Illustration of the GSIE Framework

Building on the conceptual model shown in Figure 2, this figure illustrates how a graphic score (*Dawn*, Section 1) is interpreted through the five ecological domains of GSIE, leading to diverse sonic outcomes. The diagram demonstrates how interactions across domains unfold in practice, mediated by individual and contextual factors, and how comparative interpretation gives rise to emergent knowledge.

This figure presents a schematic example of how a graphic score (*Dawn*, Section 1) is interpreted through the five ecological domains of the Graphic Score Interpretation Ecology (GSIE) framework—visual, embodied, cultural, technological, and creative—resulting in diverse sonic outcomes. The process highlights dynamic interactions across domains, mediated by individual and contextual factors, and demonstrates how comparative interpretation can generate emergent knowledge.

To clarify the operational structure of the GSIE framework, Figure 2 provides a schematic illustration of how interpretative processes unfold from a shared graphic score to diverse sonic outcomes. The example demonstrates how perception of visual elements gives rise to interpretative decisions across multiple ecological domains, including embodied experience, cultural context, technological mediation, and creative strategies. These domains interact dynamically rather than linearly, producing distinct yet related sonic results among participants.

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Rather than constituting a full case study, this illustration serves to outline the types of processes and interactions that GSIE is designed to capture. A more detailed and systematic analysis of such interpretative variations will be developed in a subsequent study.

5. System Behaviour and Generative Processes

5.1 Interaction and Emergence

The five domains operate as an interconnected system.

Creative outcomes are not attributable to a single source but emerge through interactions among human and non-human elements. Interpretation does not proceed in a linear sequence but through recursive feedback between perception, action and evaluation. The resulting works cannot be predicted from the score alone. They arise from the configuration of the system as a whole.

5.2 Graphic Scores as Generative Systems

From the perspective of GSIE, graphic scores can be approached not as notational artefacts, but as generative systems. They organise conditions for interaction, enable multiple valid outputs, and support iterative exploration. As such, graphic-score practice can be situated within wider developments in generative and system-oriented approaches to sound art and digital media.

5.3 Artistic Knowledge Production

The variability observed in the DAILY project provides a productive basis for analysing artistic knowledge. Instead of residing in individual works, such knowledge emerges through comparison across outputs, the identification of patterns, and reflection on process. In this way, the focus shifts from evaluating outcomes to understanding the systems from which they arise.

5.4 Discussion

GSIE contributes to ongoing discussions in sound-based practice by offering a framework for analysing interpretation in open-form contexts, where outcomes are not predetermined but emerge through interaction. By integrating ecological perspectives with practice-based approaches, the model shifts attention away from fixed works and toward the dynamic conditions under which sonic forms are produced. In doing so, it moves beyond representational models of interpretation, reframing it not as the realisation of a notated object but as a distributed and situated process shaped by relationships between visual structures, embodied actions, cultural contexts, and technological mediations. In this sense, interpretation does not follow the work, but actively constitutes it.

This reframing has broader implications for how creativity is understood within sound-based practices. Rather than being located in individual authorship or singular artefacts, creativity can be approached as system-dependent and distributed across interacting domains. From this perspective, the variability observed in graphic-score practices is not a by-product of indeterminacy, but a constitutive feature of the system through which artistic knowledge emerges. Such a view challenges evaluative models that prioritise fixed outcomes over processes of emergence, suggesting instead that analytical attention should be directed toward how variation is produced, sustained, and transformed across different conditions.

More fundamentally, GSIE implies a shift in ontological orientation: from viewing musical works as stable entities to understanding them as processes that unfold through interaction. This process-oriented perspective aligns graphic-score practice with broader developments in generative, ecological, and system-based approaches in contemporary art and media.

In methodological terms, GSIE also points toward new approaches to research in sound-based practices. Comparative analysis across multiple interpretations allows patterns and divergences to be identified, while system-oriented modelling provides a means of examining how such variations arise. Together, these approaches suggest a shift from evaluating discrete outcomes toward analysing the conditions and processes that generate them.

6. Conclusion

This article has addressed the problem of how interpretation can be analysed in contexts where sonic outcomes remain structurally open. In response, GSIE has been proposed as a framework that redefines interpretation not as a representational act, but as a dynamic and constitutive system. Rather than following a pre-existing work, interpretation actively participates in bringing sonic forms into being through interactions across visual, embodied, cultural, and technological domains.

By modelling the conditions under which variability emerges, GSIE provides a basis for analysing contemporary sound practices in which openness, technological mediation, and distributed creativity are central organising principles. In doing so, it shifts analytical attention from fixed outcomes to the processes and systems through which they are produced, positioning interpretation not as a secondary activity, but as a primary site of artistic formation and knowledge production. This suggests a broader rethinking of how artistic practices are analysed, moving from object-based evaluation toward process-oriented and system-based inquiry.

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