

# Narrative Continuity and Transformation in the Gog and Magog Tradition: A Human-in-the-Loop Computational Humanities Study

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## Abstract

This pilot study investigates long-term continuity and transformation in the Gog and Magog tradition using a Human-in-the-Loop computational humanities approach. The objective was to evaluate the feasibility and applicability of a standardized narrative coding framework for comparative analysis of long-duration cultural traditions. A purposive corpus of ten historically influential sources spanning approximately twenty-six centuries—from Ezekiel to nineteenth-century Protestant interpretations—was analyzed using a Narrative Unit framework consisting of five components: Actor, Threat, Cause, Solution, and Outcome. Artificial intelligence was employed as a research support tool for information extraction, textual comparison, consistency checking, and preliminary coding suggestions, while all substantive decisions regarding source selection, ontology development, coding, validation, and interpretation remained under direct researcher supervision. The analysis demonstrated that all ten sources could be represented using the same Actor–Threat–Cause–Solution–Outcome architecture, with all five components identifiable across the entire corpus. At the same time, substantial variation was observed in individual narrative components. The Actor category displayed the greatest diversity, ranging from specific historical rulers to eschatological enemies, frontier peoples, historically identified populations, and modern geopolitical actors, whereas Threat and Outcome exhibited comparatively lower variability. The findings suggest that continuity within the Gog and Magog tradition may depend less on preservation of specific historical content than on the persistence of recurring narrative functions. The corpus also exhibits a pattern of narrative layering in which newly introduced interpretative elements coexist with inherited narrative structures. Preliminary framework validation further indicated that the Narrative Unit model was sufficiently flexible to accommodate substantial historical variation while maintaining a consistent analytical structure. Although exploratory and limited in scope, the study demonstrates the potential of Human-in-the-Loop narrative coding for investigating long-term cultural transmission and transformation and provides a transparent and reproducible framework for comparative analysis of historical narratives across extended temporal scales.

**Keywords:** Gog and Magog; narrative analysis; cultural transmission; cultural evolution; computational humanities; Human-in-the-Loop; digital humanities; apocalyptic traditions; collective memory; narrative coding.

# Introduction

The Gog and Magog tradition is one of the most enduring narrative complexes in the history of Eurasian religious and political thought. Originating in the Hebrew Bible, particularly in Ezekiel 38–39, it subsequently appeared in Christian apocalyptic literature, Islamic historiography, medieval chronicles, Byzantine writings, Slavic historical traditions, and modern geopolitical interpretations (Anderson 1932; Reed 2008; Van Donzel and Schmidt 2010). Across more than two millennia, the identities, meanings, and historical referents associated with Gog and Magog have been repeatedly reinterpreted, yet the tradition itself has remained recognizable across remarkably diverse cultural, religious, and political settings.

This coexistence of change and continuity poses an important problem for the study of cultural transmission. Historical narratives routinely adapt to new political circumstances, religious doctrines, collective identities, and perceptions of external threats. Specific narrative elements may therefore change substantially over time while the broader tradition survives. Explaining how such traditions remain recognizable despite continual reinterpretation remains a central challenge in religious studies, intellectual history, comparative mythology, cultural evolution, and digital humanities (Boyd and Richerson 1985; Sperber 1996; Mesoudi 2011).

Scholarship on Gog and Magog has traditionally focused on textual origins, theological interpretation, historical identification of the actors involved, and the reception of the tradition within particular religious communities (Anderson 1932; Collins 2016; Reed 2008; Van Donzel and Schmidt 2010). Researchers have examined the biblical foundations of the narrative, its development in Christian apocalyptic traditions, its integration into Islamic accounts of Ya'juj and Ma'juj, and its adaptation within medieval and modern political discourses. While this work has produced substantial historical and philological knowledge, comparatively less attention has been devoted to the broader question of how the tradition maintained its coherence while undergoing repeated transformation across different historical contexts.

One way of approaching this problem is to distinguish between narrative content and narrative structure. Cultural evolution research views narratives not as static texts but as cultural representations that are repeatedly transmitted, reconstructed, and adapted over time (Boyd and Richerson 1985; Richerson and Boyd 2005; Mesoudi 2011). From this perspective, continuity does not depend on the faithful preservation of every detail. Instead, traditions may persist because certain underlying structures or functions remain stable even as particular elements change.

A similar argument is found in epidemiological approaches to culture. Sperber (1996) argued that cultural stability emerges not from exact copying but from recurrent reconstruction shaped by shared cognitive and social conditions. Narratives remain recognizable because they are repeatedly rebuilt around relatively stable interpretative patterns. His critique of strong memetic models further suggests that cultural persistence often depends less on replication of content than on reconstruction around enduring cognitive attractors (Sperber 2000).

Structural approaches to narrative analysis provide an additional perspective. Scholars such as Propp and Lotman argued that narratives can be understood as systems of recurring functional

relationships rather than collections of isolated characters and events (Propp 1968; Lotman 1977; Lotman 1990). Historical actors, locations, and circumstances may vary considerably, yet the narrative roles organizing these elements often display greater stability. Such approaches make it possible to investigate continuity and transformation simultaneously.

The history of Gog and Magog provides an especially suitable case for examining this proposition. Over time, Gog and Magog have been identified with invading armies, frontier peoples, eschatological enemies, historically known populations, and modern geopolitical actors. Despite these changing identifications, the broader narrative pattern remained recognizable. This suggests that the tradition may have been preserved less through stable historical referents than through the repeated reproduction of a familiar narrative structure.

Theories of collective memory offer a complementary explanation. Long-lived traditions survive because communities continually reinterpret inherited symbolic frameworks in response to changing historical circumstances (Eliade 1959; Hobsbawm and Ranger 1983). Cultural memory is therefore maintained through an ongoing balance between preservation and adaptation rather than through the retention of fixed content alone (Assmann 2011).

This study examines that possibility using a Human-in-the-Loop computational humanities approach. To facilitate systematic comparison, a standardized Narrative Unit framework was developed consisting of five analytical components: Actor, Threat, Cause, Solution, and Outcome. Together, these dimensions provide a simplified representation of narrative organization that enables comparison across heterogeneous textual traditions while preserving interpretative transparency.

Artificial intelligence was used as a research support tool for information extraction, comparison of textual material, and coding assistance. All substantive decisions regarding source selection, ontology development, coding, and interpretation remained under direct researcher supervision. This design reflects broader developments in computational humanities, where computational methods increasingly complement rather than replace traditional forms of historical analysis (Moretti 2005; Jockers 2013; Piper 2018; Underwood 2019).

The study addresses the following research question:

**How has the Gog and Magog tradition maintained continuity across multiple historical periods despite profound political, religious, cultural, and geopolitical transformations?**

To explore this question, a pilot corpus of ten historically influential sources spanning approximately twenty-six centuries was analyzed using the Narrative Unit framework. The objective is not to test a predefined theory but to evaluate whether structured narrative coding can identify recurring patterns of continuity and transformation within a long-lived cultural tradition.

By bringing together insights from cultural evolution, epidemiological models of cultural transmission, structural narrative analysis, collective memory studies, and computational humanities, this study seeks to contribute both substantively and methodologically. Substantively, it offers a comparative examination of one of the longest-lived narrative traditions in Eurasian history. Methodologically, it evaluates the potential of Human-in-the-Loop narrative coding as a

transparent and reproducible approach to the study of long-term cultural transmission and transformation.

# Methods

## Study Design

This study employed a Human-in-the-Loop computational humanities approach to investigate the long-term evolution of the Gog and Magog tradition. The analytical framework combined close reading of historical texts with AI-assisted narrative coding. Artificial intelligence was used as a research support tool for information extraction, summarization, comparison of textual passages, and consistency checking. All substantive decisions concerning source selection, ontology construction, coding, validation, and historical interpretation remained under direct researcher supervision.

The study was designed as an exploratory investigation to assess whether a standardized narrative coding framework could identify patterns of continuity and transformation across major historical stages of the Gog and Magog tradition. The objective was not to test a predefined theory but to evaluate the feasibility, applicability, and analytical usefulness of a structured narrative coding framework for the comparative study of long-term narrative development.

## Source Selection

A purposive sampling strategy was employed. Rather than attempting exhaustive coverage of all surviving Gog and Magog traditions, the study focused on historically influential texts representing major stages in the transmission and reinterpretation of the narrative.

The corpus consisted of ten sources:

1. Ezekiel 38
2. Ezekiel 39
3. Revelation 20:7–10
4. Pseudo-Methodius
5. Al-Tabari
6. Syriac Alexander Legend
7. Qur'an 18:83–99
8. Primary Chronicle
9. Byzantine Tradition
10. Nineteenth-Century Protestant Interpretation

These sources were selected because they occupy key positions in the historical development of Gog and Magog traditions across Jewish, Christian, Islamic, Byzantine, Slavic, and modern interpretative contexts. Together, the corpus spans approximately twenty-six centuries of documented narrative transmission, from the sixth century BCE to the nineteenth century CE.

The sample was not intended to be statistically representative of the entire historical corpus. Instead, it was designed to capture major developmental transitions suitable for exploratory comparative analysis.

## **Narrative Unit Framework**

To facilitate systematic comparison across heterogeneous textual traditions, each source was analyzed using a standardized Narrative Unit framework consisting of five components:

- Actor (A)
- Threat (T)
- Cause (C)
- Solution (S)
- Outcome (O)

The framework was developed inductively through preliminary examination of the corpus and was designed to capture functional narrative roles rather than specific historical details.

Each source was represented as a sequence:

**Actor → Threat → Cause → Solution → Outcome**

For example:

**A1 → T1 → C1 → S1 → O1**

This representation enabled direct comparison of narrative structures across texts separated by substantial historical, cultural, and religious distances.

## **Operational Definitions**

Coding followed predefined operational definitions.

### **Actor**

The primary individual, group, people, nation, or collective entity associated with the Gog and Magog narrative.

### **Threat**

The principal danger, challenge, or disruptive force attributed to the Actor.

### **Cause**

The explanatory mechanism responsible for the emergence, activation, release, or persistence of the Threat.

### **Solution**

The means through which the Threat is restrained, defeated, controlled, contained, or resolved.

### **Outcome**

The final condition produced by resolution of the narrative.

Where a source simultaneously exhibited multiple dominant characteristics, hybrid categories were permitted (e.g., T1/T2 or S2/S3).

## **Ontology Development**

Narrative categories were generated through iterative examination of the source material. The ontology was intentionally limited to a small number of analytically distinct categories in order to maximize comparability across historical periods.

### **Actor**

- A1: Specific historical ruler
- A2: Frontier or hostile peoples
- A3/A4: Universalized or eschatological enemies
- A5: Historically identified populations
- A6: Modern geopolitical actors

### **Threat**

- T1: Military invasion
- T2: Eschatological conflict
- T1/T2: Combined military and eschatological threat

### **Cause**

- C1: Divine plan
- C2: Divinely governed release of destructive forces
- C3: Historical-civilizational explanation
- C4: Modern geopolitical or ideological explanation

### **Solution**

- S1: Direct divine intervention
- S2: Physical containment
- S3: Organized human response
- S4: Collective historical or civilizational response

### **Outcome**

- O1: Defeat of aggressor
- O2: Eschatological resolution
- O3: Restoration and purification

The ontology remains provisional and may be refined as additional sources are incorporated into future stages of the project.

## **Coding Procedure**

Each source was subjected to close reading and narrative coding. The coding process consisted of four stages:

1. Identification of passages directly related to Gog and Magog.
2. Extraction of dominant narrative elements.
3. Assignment of Actor, Threat, Cause, Solution, and Outcome categories.
4. Construction of a Narrative Unit sequence for comparative analysis.

Artificial intelligence was used to assist in identifying candidate narrative elements and generating preliminary classifications. All AI-generated outputs were treated as provisional analytical suggestions. Final coding decisions were reviewed, revised where necessary, and approved by the researcher.

When multiple interpretations were possible, coding was based on the dominant narrative function within the text rather than on isolated textual details. Coding decisions were documented throughout the study in an analytical coding log. The complete coding matrix is reported in the Results section.

### **Analytical Strategy**

The study employed qualitative comparative analysis rather than formal statistical modeling.

The analysis focused on four dimensions:

1. **Structural Continuity** – the extent to which the Actor–Threat–Cause–Solution–Outcome architecture remained recognizable across sources.
2. **Component Variability** – the degree to which individual narrative components changed across historical stages.
3. **Narrative Layering** – the preservation of earlier narrative elements alongside newly introduced motifs and interpretative structures.
4. **Framework Applicability** – the extent to which the Narrative Unit framework could be applied consistently across diverse historical, religious, and textual contexts.

Comparisons were conducted sequentially across historical stages to identify patterns of persistence, modification, and expansion within the tradition.

In addition, simple descriptive measures were calculated, including:

- presence of narrative components across sources;
- number of distinct states observed for each component;
- relative ordering of component diversity.

These measures were used solely for exploratory purposes and were not interpreted as formal statistical estimates.

Framework applicability and internal consistency were further assessed through examination of component presence, category diversity, and consistency of framework application across all analyzed sources.

### **Transparency and Quality Control**

Several measures were implemented to improve analytical transparency and reproducibility. These included application of an identical coding framework to all sources, explicit operational definitions, systematic documentation of coding decisions, separation of empirical observations from theoretical interpretation, and Human-in-the-Loop review of AI-assisted outputs.

All analyzed sources are publicly available historical texts. The coding framework, category definitions, coding decisions, and analytical procedures are explicitly documented to facilitate replication and future extension of the study. The Human-in-the-Loop design ensured that artificial intelligence functioned as an analytical aid rather than an autonomous interpreter, while all substantive conclusions remained under researcher control.

## Results

### Overview

The corpus consisted of ten historically influential textual stages in the development of the Gog and Magog tradition, spanning approximately twenty-six centuries from the Book of Ezekiel to nineteenth-century Protestant interpretations.

All sources were analyzed using the Narrative Unit framework:

**Actor (A) → Threat (T) → Cause (C) → Solution (S) → Outcome (O)**

The objective of the analysis was to identify patterns of continuity and variation across historically distinct textual traditions. The results presented below are descriptive and exploratory. No formal statistical inference was performed.

### 1. Narrative Coding Matrix

Table 1 presents the complete coding matrix generated during the analysis.

**Table 1. Narrative Unit Coding Matrix**

Source	Actor	Threat	Cause	Solution	Outcome
Ezekiel 38	A1	T1	C1	S1	O1
Ezekiel 39	A1	T1	C1	S1	O3
Revelation 20:7–10	A3/A4	T2	C2	S1	O2
Pseudo-Methodius	A2	T2	C2	S1	O2
Al-Tabari	A2	T1/T2	C2	S1	O2
Syriac Alexander Legend	A2	T1/T2	C2	S2	O2
Qur'an 18:83–99	A2	T1/T2	C2	S2/S3	O2
Primary Chronicle	A5	T1/T2	C3	S4	O2
Byzantine Tradition	A5	T2	C3	S4	O2
Nineteenth-Century Protestant Interpretation	A6	T2	C4	S4	O2

The coding matrix constitutes the empirical basis for all subsequent observations.

## 2. Presence of Narrative Components

All five Narrative Unit components were identifiable in every source.

**Table 2. Presence of Narrative Components**

### Component Presence

Actor	10/10
Threat	10/10
Cause	10/10
Solution	10/10
Outcome	10/10

No source lacked any component of the framework. The Actor–Threat–Cause–Solution–Outcome structure was applicable across the entire corpus.

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## 3. Diversity of Narrative Components

To assess variation within the corpus, the number of distinct coded states was calculated for each component.

**Table 3. Distinct States Observed Across the Corpus**

Component	Distinct States
Actor	6
Threat	3
Cause	4
Solution	4
Outcome	3

Actor displayed the highest number of distinct states. Threat and Outcome displayed the lowest observed diversity, while Cause and Solution occupied an intermediate position. These values are reported as descriptive counts rather than inferential statistics.

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## 4. Variation in the Actor Component

Actor exhibited the greatest variability among all coded dimensions.

The categories observed across the corpus can be arranged chronologically as follows:

**A1 → A3/A4 → A2 → A5 → A6**

These categories correspond to:

- specific historical ruler;
- universalized eschatological enemies;
- frontier or hostile peoples;
- historically identified populations;
- modern geopolitical actors.

No single Actor category remained dominant throughout the corpus.

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## 5. Variation Across Narrative Components

The remaining narrative dimensions displayed lower levels of variation.

### Threat

The observed categories can be arranged chronologically as follows:

**T1 → T2 → T1/T2 → T2**

Early sources emphasize military invasion, whereas later traditions increasingly incorporate eschatological conflict. Several medieval sources combine both dimensions through hybrid coding (T1/T2).

### Cause

The observed categories can be arranged chronologically as follows:

**C1 → C2 → C3 → C4**

When arranged chronologically, the categories can be interpreted as indicating increasing reliance on historical-civilizational and geopolitical explanations alongside earlier theological interpretations.

### Solution

The observed categories can be arranged chronologically as follows:

**S1 → S2 → S2/S3 → S4**

When arranged chronologically, the categories can be interpreted as indicating greater emphasis on containment mechanisms and collective human responses in addition to direct divine intervention.

### Outcome

The observed categories can be arranged chronologically as follows:

**O1 → O3 → O2**

Outcome categories displayed comparatively low variability, with eschatological resolution (O2) becoming the most frequent outcome in later sources.

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## 6. Narrative Layering

The coded dataset indicates the coexistence of recurring and newly introduced narrative elements.

Recurring elements include:

- hostile external agents;
- threats to established order;
- supra-human governance of historical processes;
- post-conflict restoration.

Newly introduced elements include:

- universal eschatological warfare;

- civilizational frontier structures;
- containment barriers;
- organized collective responses.

These observations suggest that later traditions incorporated additional narrative motifs while retaining elements already present in earlier stages of transmission. The coexistence of recurring and newly introduced elements indicates that later versions of the tradition expanded earlier narrative structures rather than replacing them entirely.

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## **7. Structural Continuity Across Historical Periods**

All sources could be represented using the same five-component structure:

**Actor → Threat → Cause → Solution → Outcome**

Despite substantial variation in the content of individual components, the overall narrative architecture remained applicable throughout the corpus. This persistence represents the most consistent structural pattern identified in the analysis.

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## **8. Summary of Findings**

Five principal descriptive findings emerge from the analysis:

1. All sources could be represented using the Narrative Unit framework.
2. Actor exhibited the highest categorical variability, with six distinct states.
3. Threat, Cause, Solution, and Outcome displayed lower levels of variation.
4. The corpus contains both recurring and newly introduced narrative elements.
5. Structural continuity and component-level variation coexisted throughout the tradition.

Overall, the results document the coexistence of a stable narrative architecture and substantial variation in individual narrative components across approximately twenty-six centuries of transmission.

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## **9. Framework Applicability and Internal Validation**

Because a central objective of the study was to evaluate the feasibility, applicability, and analytical usefulness of the Narrative Unit framework, an additional assessment of framework performance was conducted.

The framework was successfully applied to all ten sources included in the corpus without requiring source-specific modifications or the introduction of ad hoc analytical categories. All five components were identifiable in every analyzed source, indicating that the framework was applicable across the full range of historical materials examined.

The framework also demonstrated sufficient flexibility to accommodate substantial variation in historical context, religious tradition, textual genre, and narrative content. Sources spanning approximately twenty-six centuries, from Ezekiel to nineteenth-century Protestant interpretations, could all be represented using the same analytical architecture. This finding

suggests that the framework captures structural features that remain comparable across diverse historical settings.

The successful coding of all sources using a common ontology further supports the practical feasibility of the framework for comparative analysis of long-duration narrative traditions.

Additional evidence of internal robustness is provided by the distribution of category states. All components exhibited meaningful variation, indicating that the framework was sensitive to historical differences rather than merely imposing a fixed template on the material. At the same time, the consistent presence of all five components across the corpus suggests a stable underlying narrative organization.

**Table 4. Framework Applicability Indicators**

<b>Component</b>	<b>Presence</b>	<b>Distinct States</b>
Actor	10/10	6
Threat	10/10	3
Cause	10/10	4
Solution	10/10	4
Outcome	10/10	3

Taken together, these observations provide preliminary evidence for the applicability, internal robustness, and analytical usefulness of the Narrative Unit framework as a tool for comparative narrative analysis. The framework proved sufficiently stable to support comparison across widely separated historical traditions while remaining sensitive to important patterns of narrative variation.

Because this investigation represents an exploratory study, these validation findings should be regarded as provisional. Future research should extend evaluation through independent intercoder reliability assessment, application to larger corpora, and comparison with other long-duration narrative traditions. Nevertheless, the present results indicate that the framework possesses adequate transparency, consistency, and analytical utility for investigating long-term processes of cultural transmission and narrative change.

## **Discussion**

### **Interpretation of the Findings**

The objective of this study was to evaluate whether a standardized Narrative Unit framework could be used to analyze long-term transformations of the Gog and Magog tradition across diverse historical contexts. The results indicate that all ten analyzed sources could be represented using the same five-component structure:

**Actor → Threat → Cause → Solution → Outcome**

This finding is noteworthy because the corpus spans approximately twenty-six centuries and includes Jewish, Christian, Syriac, Islamic, Byzantine, Slavic, and modern interpretative

traditions. Despite substantial differences in historical setting, religious affiliation, political circumstances, and textual genre, the same analytical framework remained applicable throughout the corpus.

The findings suggest that continuity within the Gog and Magog tradition may reside less in the preservation of specific historical content than in the persistence of recurring narrative functions. Although actors, explanations, and historical referents changed repeatedly, the broader narrative architecture remained recognizable across all analyzed sources. This interpretation is consistent with structural approaches to narrative analysis, which emphasize the relative stability of narrative functions despite variation in narrative content (Propp 1968; Lotman 1977; Lotman 1990; White 1973; Ryan 2004).

More broadly, the results support the proposition that long-lived cultural traditions can preserve continuity while simultaneously adapting to changing historical environments. Such coexistence of stability and change occupies a central position in narrative theory, semiotics, collective memory research, and cultural evolution scholarship (Boyd and Richerson 1985; Sperber 1996; Mesoudi 2011).

### **Stability and Variability**

The analysis revealed substantial differences in the degree of variability among narrative components. Actor exhibited the highest observed diversity, whereas Threat and Outcome displayed comparatively lower diversity.

Across the corpus, actors changed repeatedly—from a specific ruler, to eschatological enemies, to frontier peoples, historically identified populations, and modern geopolitical actors. Yet despite these transformations, the narrative role remained remarkably consistent. Regardless of historical identity, the actor functioned as a disruptive force threatening an established order.

Outcome categories displayed a similar degree of stability. Although traditions differed in their specific formulations, outcomes repeatedly involved restoration, protection, purification, or the re-establishment of order following conflict.

From the perspective of cultural evolution, this pattern is significant because it suggests that cultural persistence may depend less on preserving particular historical identities than on maintaining functional relationships between narrative components. In the Gog and Magog tradition, continuity appears to derive primarily from the preservation of narrative roles rather than specific historical referents.

### **Narrative Layering and Cultural Adaptation**

One of the most notable observations emerging from the coding matrix is the coexistence of recurring and newly introduced narrative elements.

Recurring motifs included external enemies, threats to established order, supra-human governance of historical processes, and restoration following crisis. At the same time, later traditions introduced new elements such as universal eschatological warfare, containment barriers, frontier-civilizational interpretations, and organized collective responses.

Rather than replacing earlier motifs, later traditions frequently incorporated them into expanded interpretative frameworks. The findings therefore suggest a process of cumulative narrative development in which inherited structures were preserved while additional explanatory layers were introduced.

This pattern is consistent with epidemiological approaches to culture, which emphasize recurrent reconstruction rather than faithful replication (Sperber 1996). Cultural representations survive because they are repeatedly recreated within new social and historical environments. The durability of the Gog and Magog tradition appears to stem not from resistance to change but from the capacity to accommodate changing historical circumstances while preserving recognizable narrative organization.

### **Gog and Magog as a Cultural Model of Crisis**

A recurring pattern across the corpus was the association of Gog and Magog with situations perceived as threatening social, religious, political, or civilizational order.

Although the identities assigned to Gog and Magog changed substantially over time, the tradition consistently positioned these actors as sources of large-scale disruption. The narrative repeatedly provided a framework for interpreting episodes of perceived existential danger and historical uncertainty.

From this perspective, the Gog and Magog tradition may be understood as a cultural model of crisis. The narrative offers a recognizable structure through which communities can identify threats, explain the emergence of disorder, anticipate confrontation, and imagine eventual restoration.

This interpretation aligns closely with scholarship on apocalyptic thought. As Collins has argued, apocalyptic narratives frequently emerge in situations of perceived instability and provide explanatory frameworks through which communities interpret crisis and uncertainty (Collins 1984; Collins 2016). The Gog and Magog tradition appears to represent a particularly durable example of this broader phenomenon.

The findings also resonate with collective memory research. Cultural memories often persist through repeated reinterpretation of inherited symbolic frameworks rather than through preservation of fixed historical content (Assmann 2011). The Gog and Magog tradition appears to exemplify this process.

### **Implications for the Study of Cultural Transmission**

The findings have implications beyond the specific case of Gog and Magog. Many studies of religious and historical narratives focus primarily on textual origins, historical reconstruction, or theological interpretation. The present study suggests that an additional perspective may be gained by examining narratives as structured systems composed of recurring functional components.

Under this approach, continuity is not defined solely by the preservation of specific characters, locations, or historical claims. Instead, continuity may emerge through the persistence

of narrative architecture despite substantial changes in narrative content. Such a perspective provides a useful bridge between narrative theory, cultural evolution, memory studies, and computational humanities.

More broadly, the findings support the view that cultural persistence often depends upon the transmission of organizational principles rather than exact informational content (Boyd and Richerson 1985; Richerson and Boyd 2005; Mesoudi 2011). The Gog and Magog tradition illustrates how a narrative can remain recognizable across millennia despite repeated reinterpretation of its actors, historical referents, and geopolitical meanings.

## **Methodological Contributions**

The study also contributes to methodological discussions concerning the use of artificial intelligence in humanities research. The Human-in-the-Loop design allowed AI systems to assist with information extraction, comparison of textual material, and preliminary coding suggestions while maintaining researcher control over all substantive decisions.

The findings suggest that AI-assisted narrative coding may provide a practical mechanism for organizing complex historical material while preserving interpretative accountability. Rather than functioning as an autonomous interpreter, artificial intelligence served as a tool for structured comparison, consistency checking, and exploratory analysis.

More broadly, the project demonstrates how computational methods can support the investigation of long-duration cultural phenomena spanning multiple languages, religious traditions, and historical periods. Human-in-the-Loop approaches may therefore represent a productive middle ground between conventional qualitative interpretation and fully automated text analysis.

Taken together, the results indicate that Human-in-the-Loop computational humanities methods may be particularly valuable for investigating cultural traditions characterized by extensive temporal depth, substantial historical variation, and complex patterns of transmission and adaptation.

## **Limitations**

Several limitations should be considered when interpreting the findings.

First, the corpus was intentionally selective and consisted of only ten historically influential sources. Although these texts represent major stages in the historical development of the Gog and Magog tradition, they do not capture the full diversity of surviving textual variants, regional traditions, or local interpretations. Consequently, the observed patterns should not be assumed to represent the entirety of the historical tradition.

Second, coding was conducted under the supervision of a single researcher. Independent intercoder reliability assessment was not performed, and future investigations should examine the reproducibility of the Narrative Unit framework across multiple analysts and research teams.

Third, although the study provided preliminary evidence regarding the applicability, internal robustness, and construct validity of the Narrative Unit framework, no formal statistical

validation or independent intercoder reliability testing was conducted. Accordingly, the validation findings should be regarded as provisional and subject to further empirical evaluation.

Fourth, the ontology was developed inductively for the purposes of this exploratory investigation. While it proved applicable across all sources included in the corpus, additional categories or modifications may be required when analyzing other textual traditions, languages, historical periods, or narrative domains.

Fifth, the study relied primarily on qualitative coding and descriptive comparison rather than formal statistical modeling. The reported patterns should therefore be interpreted as exploratory observations intended to identify potential regularities rather than definitive empirical conclusions.

Finally, the identification of narrative functions necessarily involves a degree of interpretative judgment despite the use of explicit operational definitions and systematic coding procedures. The Human-in-the-Loop design was intended to enhance transparency, consistency, and methodological accountability; however, interpretative decision-making remains an inherent aspect of humanities research.

Taken together, these limitations reflect the exploratory and methodological character of the study. Accordingly, the findings should be viewed as preliminary and hypothesis-generating, providing a foundation for larger comparative investigations involving expanded corpora, independent validation procedures, intercoder reliability assessment, and more formal analytical techniques.

## **Future Research**

Several directions for future research emerge from the present investigation.

The most immediate priority is expansion of the corpus. Additional Jewish, Christian, Islamic, medieval, early modern, and contemporary sources could be incorporated to evaluate the robustness of the patterns identified in this pilot study and to improve historical coverage of the tradition.

Future work should also employ independent coders to assess intercoder reliability and examine the reproducibility of the Narrative Unit framework. Such validation would strengthen confidence in the consistency, transparency, and analytical usefulness of the coding procedure.

As larger corpora become available, more advanced analytical techniques may be applied, including network analysis, clustering methods, similarity measures, sequence analysis, and computational models of narrative evolution. These approaches could help identify broader patterns of transmission and transformation that remain difficult to detect within a small exploratory dataset.

The ontology itself may be refined through iterative testing on additional materials. Future studies should examine whether the Narrative Unit framework can be generalized beyond the Gog and Magog tradition to other long-lived religious, mythological, and historical narratives.

More broadly, comparative applications may help determine whether the coexistence of structural persistence and content-level adaptation observed in this study represents a more general characteristic of long-duration cultural traditions.

## **Conclusion**

This study examined the historical development of the Gog and Magog tradition using a standardized Narrative Unit framework within a Human-in-the-Loop computational humanities design. Across ten influential sources spanning approximately twenty-six centuries, every narrative could be represented using the same Actor–Threat–Cause–Solution–Outcome structure.

The analysis revealed a persistent pattern of structural continuity alongside substantial historical variation. Although the identities associated with Gog and Magog, the explanations of conflict, and their historical interpretations changed repeatedly across time, the underlying narrative organization remained recognizable throughout the corpus.

The findings suggest that the long-term persistence of the tradition may depend less on the preservation of specific historical referents than on the retention of recurring narrative functions. Across diverse cultural and historical settings, the tradition repeatedly provided a framework for identifying threats, explaining disorder, anticipating confrontation, and envisioning the restoration of order.

The study also provides preliminary support for the applicability of the Narrative Unit framework as a tool for comparative narrative analysis. The framework proved capable of capturing both continuity and variation across texts separated by substantial historical, cultural, and religious distances while remaining sufficiently flexible to accommodate changing narrative content.

Although exploratory in scope, the investigation demonstrates the potential of structured narrative coding for studying processes of cultural transmission and transformation across extended historical periods. More broadly, it offers initial evidence that enduring cultural traditions may preserve continuity through stable narrative organization while simultaneously adapting their content to changing historical circumstances.

In doing so, the study contributes both to understanding the historical evolution of the Gog and Magog tradition and to the development of transparent, reproducible, Human-in-the-Loop approaches within computational humanities research.

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