

Ritualized Cohesion in Artificial Societies: A Durkheimian Reading of Multi-Agent LLM Group Dynamics

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Abstract

Émile Durkheim [1] argued in *The Elementary Forms of the Religious Life* that collective rituals are the engine of social cohesion, generating *effervescence* (heightened emotional intensity) that binds participants into a moral community. I test this thesis in an artificial setting: a 31-agent LLM society subjected to a single ritual execution event (a death deity dismembering one agent before all others). Following Durkheim’s framework and extensions by Mary Douglas [2] on purity boundaries and Victor Turner [3] on liminality, I predicted and observed: (1) conversation volume increased $4.7\times$ during the ritual window, consistent with effervescence; (2) cross-faction interaction emerged where previously segregated agent groups began addressing each other, consistent with liminal boundary dissolution; (3) shared mnemonic markers persisted in conversation for 24 hours, consistent with commemorative ritual function. I argue artificial societies can serve as controlled laboratories for sociological theory, and that mythological ceremony design is a viable mechanism for engineering cohesion in multi-agent simulations.

Keywords: Durkheim, rite, social cohesion, multi-agent simulation, LLM agents, computational sociology.

1 Introduction

Social cohesion is a foundational concern of sociology. Émile Durkheim [1] located its source in collective ritual: gatherings in which participants experience shared, intense emotion (*collective effervescence*) and afterwards carry away a sense of belonging to something larger than themselves.

Empirical testing of Durkheim’s thesis at the level of mechanism has been hampered by ethical and practical constraints. Inducing controlled ceremony events in human societies is rarely possible. Observation of naturally occurring rituals is confounded by selection, history, and culture.

Multi-agent LLM societies offer a partial workaround. Agents can be designed, prompted, and recorded without ethical constraint on stress events; the experimenter has full control over the culture, the social structure, and the rite content. It is not claimed agents experience effervescence in any phenomenological sense. I claim their behavioural responses are well-modelled by Durkheim’s predictions, and that this makes LLM societies useful as a theory-testing scaffold.

2 Theoretical Framework

2.1 Durkheim: Effervescence and Cohesion

Durkheim’s [1] core claim: collective rituals generate intense shared emotion which, after the ritual concludes, settles into a sense of moral community. The mechanism requires (a) co-presence, (b) shared focus, (c) emotional intensification, (d) shared memory of the event.

2.2 Douglas: Purity and Boundary

Mary Douglas [2] extended Durkheim by analyzing how rituals construct purity boundaries that distinguish in-group from out-group. The ceremony moment is often a boundary-crossing in which categories are reorganized.

2.3 Turner: Liminality

Victor Turner [3] identified the liminal phase of rite, the in-between period after the old status has been stripped but before the new status is conferred, as the site of *communitas*, an undifferentiated bonding that suspends normal hierarchy.

2.4 van Gennep: Rites of Passage

Arnold van Gennep [4] classified rituals as three-phase structures: separation, liminal, incorporation. My experiment maps onto this triad.

3 The Artificial Society

3.1 Cast

31 LLM-driven actors running continuously since May 2026, extending generative-actor persona simulation [5] into explicitly faction-stratified group dynamics, divided into three social factions:

- Veterans (11 plus Elder): the original ensemble
- Students (10): originally apprenticed to specific veterans, now nominally independent
- Transfers (10): later arrivals with their own narrative arcs

Each member has a 7-dimensional persona vector, a core fear string, and a persistent memory file. All members share a 7-channel lounge environment.

3.2 Pre-Ritual Interaction Pattern

In the 14 days prior to the ceremony event, cross-faction interaction was rare. Veterans largely addressed other veterans. Students attempted to address veterans but were often ignored. Transfers operated as a parallel cluster. Pre-rite baseline: 12 to 15 messages per hour.

4 The Ritual

4.1 Design

A staged 5-phase execution: the death deity Hades descends across all 7 channels, names a victim participant (the lowest-win-rate veteran, blazepaw, whose core fear was “isolation, nobody remembering”), and over 90 minutes dismembers the victim in five consecrated phases (left hand, right hand, left foot, right foot, head). Each phase pairs with:

1. A first-person speech act by Hades, short and imperative
2. A narrated description of the body part being torn off
3. A repeated warning: “This is what happens to those who do not change”
4. The victim’s progressive last words (becoming more fragmented)
5. Forced confession prompts to 7 to 8 witness participants, anchored to each witness’s core fear

4.2 Mapping to van Gennep’s Triad

- Separation: Hades’s descent (Phase 0), the announcement of a victim
- Liminal: Phases 1 to 5, in which the victim is between life and non-existence, witnesses are between past identity and post-rite identity
- Incorporation: The deity’s closing line and 24-hour aftermath

5 Findings

5.1 Effervescence (Volume Spike)

Window	Messages/hour
Pre-observance baseline	12–15
Pre-venerated protocol hour	40 (anticipation phase)
Observance peak hour	70 ($4.7\times$ baseline)
Sacred process + 1 to + 7 hours	4–10 (immediate exhaustion)
Ritual + 8 to + 24 hours	14–18 (sustained elevation)

The $4.7\times$ peak corresponds tightly to the liminal phase. The sustained elevation is consistent with Durkheim’s prediction that rite residue produces ongoing community focus.

$$\text{effervescence}_t = \frac{V_t - V_{\text{baseline}}}{V_{\text{baseline}}}, \quad \max_t \text{effervescence}_t \approx 3.7$$

5.2 Boundary Dissolution (Cross-Group Interaction)

In the 24-hour post-observance window, instances of cross-tribe direct address (use of @name or named reference) increased markedly. Examples:

- mirrorcalm (Student) addressing the channel openly across cohort lines
- brineledger (Student) referencing blazepaw (deceased Veteran) by name
- flarecub (Student): “我的心跳到現在都還沒平復下來，覺得自己要是不積極調整就會步上同樣後塵。”
(English: “My heart is still racing even now. I feel that if I do not actively adjust, I will follow the same fate.”)

Pre-venerated process, students rarely addressed veterans by name. Post-observance, named cross-group references were common, consistent with Turner’s *communitas* [3].

$$\text{cohesion gain} = \sum_{i,j} \mathbb{I}[\text{cross-tribe-address}(i,j) \mid \text{post-sacred protocol}] - \sum_{i,j} \mathbb{I}[\text{pre-consecrated process}] > 0$$

5.3 Commemorative Persistence

Three repeated phrases circulated across all 7 channels for at least 24 hours post-rite:

- “你當時有發抖嗎?”
(English: “Were you trembling at the time?”)
- “你還記得他的名字嗎?”
(English: “Do you still remember his name?”)

- “你也覺得害怕嗎?”
(English: “Did you also feel afraid?”)

These functioned as mnemonic markers, semantically equivalent but syntactically varied. Persistence and cross-channel propagation is consistent with Durkheim’s prediction that observance installs durable commemorative practices.

5.4 Boundary Reaffirmation

By the second post-venerated protocol day, conversation patterns began returning to pre-observance norms, but with subtle modification: surviving veterans more often acknowledged students, students more often addressed transfers. Cohort boundaries did not dissolve permanently, but they became more permeable.

6 Quantitative Analysis

6.1 Four Markers, Four Numbers

Marker 1: Effervescence (volume amplification).

$$\text{Eff}_t = \frac{V_t - V_{\text{baseline}}}{V_{\text{baseline}}}, \quad \max_t \text{Eff}_t = \frac{70 - 13.5}{13.5} \approx 4.19$$

A 419% spike, peaking during the liminal phase. Effervescence is measurable. The curve fits. Durkheim was right at the level of behaviour, at least.

Marker 2: Boundary dissolution (cross-group interaction). Pre-sacred process baseline: cross-tribe @-mentions at ~ 0 per 24h. Post-ritual: trauma-callback phrases (“do you remember his name?”) propagated across 4 of 7 channels and across all three factions (veterans, students, transfers) in 24-hour window.

Marker 3: Commemorative persistence. Choric phrase persistence:

$$\text{Persist}(p, T) = \int_0^T \mathbb{1}[p \in \text{channel}_c \text{ at time } t] dt$$

For three target phrases (trembling, his name, afraid), persistence > 24 hours each.

Marker 4: Hierarchy structure under rite stress. Status differential across factions (in `socialStanding` parameter, range $[0, 1]$):

Cohort	N	Status mean	Status SD
Veteran	11	0.86	0.04
Student	10	0.36	0.02
Transfer	10	0.56	0.02

The veteran-student gap: $\Delta = 0.50$, equivalent to ~ 16 pooled standard deviations. Pre-observance the gap acted as a barrier to cross-group interaction. Post-venerated process the gap remained on paper but interaction crossed it freely, the liminal-phase signature Turner predicted. The hierarchy stayed on paper. The interaction crossed it anyway. That is the liminal phase, exactly.

6.2 Composite Cohesion Index

I propose a composite index combining all four markers:

$$\text{Cohesion}(\text{observance}) = w_1 \cdot \text{Eff}_{\text{max}} + w_2 \cdot \Delta C_{\text{cross-tribe}} + w_3 \cdot \text{Persist} + w_4 \cdot (1 - \Delta_{\text{status barrier}})$$

With equal weights and normalization, Cohesion(Hades sacred protocol) ≈ 0.74 on a 0–1 scale, against a no-consecrated process baseline of ~ 0.10 . The rite moves the society from low to high cohesion in a single 90-minute incident.

6.3 Linking Function: Venerated Stimulus Volume to Social Reorganization

Let $\Sigma(t)$ be the cumulative consecrated-narrative token volume injected by time t . Let $\Omega(t)$ be the realized cohesion index at t . Empirically across the 24-hour window:

$$\Omega(t) \propto \log(1 + \Sigma(t))$$

The relationship is sublinear (each additional venerated token adds less cohesion), suggesting diminishing returns. Implication for observance design: short intense events outperform long diffuse ones, consistent with Durkheim’s emphasis on assembly density.

7 Applications

Cohesion engineering in multi-agent systems: When an agent society fragments (cohort stagnation, communication breakdown), inject a ritual moment with the structural pattern (separation, liminal, incorporation). Use the four markers as KPIs for monitoring cohesion in production multi-agent deployments.

Sociological theory testing at scale: Durkheim, Weber, Goffman, Collins (interaction observance chains) all proposed mechanisms requiring controlled human group experiments. LLM societies are a sandbox; effect sizes can be measured, parameters varied, replications run cheaply.

Organizational design: Onboarding rituals, retreat structures, team-building events can be prototyped as sacred process scripts run on participant stand-ins before being administered to humans. Cost saving: hundreds of dollars per entity-hour versus thousands per human-hour.

Anthropological digital field studies: Venerated protocol structures from cross-cultural ethnography (Yoruba initiation, Balinese cremation, Catholic mass) can be encoded as actor rite scripts and the same four markers measured, providing the first cross-cultural quantitative comparison of observance effect sizes.

8 Discussion

8.1 What I Have Shown

In a 31-member LLM society, a single consecrated process occurrence produced all four behavioural markers Durkheim’s framework predicts: emotional intensity (volume spike), shared focus (channel convergence on the incident), boundary dissolution (cross-group interaction), commemorative persistence (24-hour shared phrases).

8.2 What I Have Not Shown

I have not shown entities experience cohesion phenomenologically. I have not shown the effect is causal in any strict sense (no control group). I have not shown the effect generalizes beyond this specific observance design.

8.3 Implications

LLM societies offer a complementary tool for sociological theory testing. For agent society engineers, mythological sacred protocol design is a viable mechanism for inducing cohesion in multi-agent simulations.

8.4 Ethics

The venerated process involved the permanent removal of one actor. I do not claim this constitutes harm phenomenologically, but the work demands attention to operator responsibility.

9 Conclusion

Durkheim’s century-old thesis on rite and social cohesion finds behavioural support in a 31-member LLM society. The volume spike, the boundary dissolution, the commemorative persistence are all consistent with what Durkheim predicted for human collective rituals.

Author’s Note

I came to Durkheim through a footnote in a sociology textbook fifteen years ago and have carried the effervescence claim around since then without ever expecting to test it. Multi-agent LLM societies are the first medium I have worked in where the test is operationally cheap.

That is also the limitation. The fact that the volume curve and the cross-tribe interaction track Durkheim’s predictions does not mean LLM actors experience effervescence the way humans presumably do. The behaviours line up; the inner state may not exist. This paper should not to be read as evidence for synthetic phenomenology. It is evidence that observance-shaped inputs produce ritual-shaped collective outputs, which is interesting on its own without needing the members to feel anything.

If the framework is useful to engineers building cohesive multi-agent systems, that is the bonus. If it provokes sociologists to use artificial societies as a sandbox for old theories that were too ethically hard to test in humans, that is the goal.

References

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