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Submitted: 28/07/2026 - Accepted: 15/08/2026 – Published: 28/09/2026

The Social Grammar of Mongolian Horn Motifs: A Theoretical Framework for Indigenous Knowledge Teaching and Cultural Heritage Inheritance

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DOI: 10.26417/ee0kqv05

Abstract

Mongolian horn decorative motifs, locally termed ebür ugalz, transcend simple ornamental aesthetics; they operate as a structured visual symbolic system that records nomadic ecological wisdom, clan hierarchical norms and cross-generational cultural memory. Despite growing academic interest in Mongolian folk decorative art, existing research mostly categorises these visual symbols as static aesthetic carriers based on superficial visual traits, ignoring their core value in shaping group cultural identity and passing down indigenous civilisation to youth groups. To fill this research gap, this paper constructs a social semiotic analytical framework, linking the formal structural logic of horn motifs with their instructional and identity-building functions within Mongolian herding societies. Relying on ethnographic field surveys carried out across 12 pastoral settlements spanning Inner Mongolia and the Mongolian Plateau from 2022 to 2025, this research adopts dual research paths: visual content coding analysis covering 167 handmade craft relics, plus semi-structured depth interviews with 18 hereditary craft inheritors and ritual cultural practitioners. Data sorting identifies three core independent visual semantic units, four visual deformation rules for semantic adjustment, and three overall layout logic frameworks that together constitute a complete generative symbolic system. Significantly, each structural tier carries unique social connotations: the choice of basic graphic units signals clan belonging; graphic deformation rules record seasonal grassland ecological rhythms; and integral layout modes correspond to sacrificial hierarchical orders and domestic spatial ethics. Survey outcomes further prove that learning horn motif creation serves as an informal educational carrier, through which adolescents simultaneously absorb nomadic moral codes, kinship operation rules and cosmic worldviews

alongside handcraft skills. This paper finally proposes that embedding such visual symbolic logic into formal indigenous cultural courses can create a culturally rooted solution to preserve nomadic knowledge systems amid rapid socio-economic restructuring. By redefining horn motifs as a complete social symbolic language rather than mere decorative patterns, this study delivers a replicable analytical paradigm for exploring how native visual symbols sustain cultural continuity and shape group identity.

Keywords: indigenous knowledge teaching; cultural heritage inheritance; social semiotics; nomadic visual symbolic logic; Mongolian horn motifs; art-integrated teaching methodology; intangible cultural heritage

1. Introduction

Native visual symbolic systems have long acted as core carriers for storing and inheriting cultural wisdom among ethnic groups lacking complete written historical records. For Mongolian herding communities, horn motifs—locally named *ebür ugalz*—are one representative symbolic category: a highly standardised visual language embedded in daily supplies, sacrificial textiles and yurt architectural components. Such decorative symbols widely appear on saddle accessories, silver tableware, felt blankets, wooden dome frames of yurts and garment embroidery, forming an all-pervasive decorative landscape in both daily domestic spaces and ritual scenarios. Nevertheless, despite their wide application and core cultural status, current studies only classify horn motifs based on external forms, separating these graphic symbols from the social communication and educational inheritance mechanisms that endow them with actual semantic meaning.

Over the past thirty years, the traditional craft inheritance chain across Inner Asian pastoral societies has faced continuous breakdown. Urban sprawl, reduced multi-generational cohabitation and the shift from migratory herding to fixed residential lifestyles have damaged the informal apprenticeship model, through which young generations previously mastered the skills of recognising, making and interpreting horn motifs. The visual symbolic literacy once universally shared by all pastoral residents has gradually become exclusive professional knowledge of a small number of skilled artisans. This phenomenon raises urgent research questions: how can indigenous wisdom hidden in horn motifs be retained and disseminated under modern formal educational systems?

This paper puts forward a core standpoint: Mongolian horn motifs form a social symbolic language—a rule-based visual system whose internal structural characteristics cannot be separated from the social relations, ecological cognition and educational practices of herding producers. Breaking away from single formal descriptive analysis, this research explores three core research questions: what social and educational functions does this visual symbolic system undertake? How do the

composition rules of horn motifs record clan identity, pastoral ecological ethics and cosmic cognition? In what ways does mastering horn motif creation act as informal cultural education, and what practical references can this provide for formal indigenous cultural teaching programmes?

This research fills the interdisciplinary research blank spanning Mongolian folk culture, social semiotics and indigenous education. While shape morphology and visual decomposition analysis have been applied to multiple traditional decorative systems, relevant research mostly stays at formal sorting without connecting graphic structural rules to social semantics or instructional value. Conversely, studies focusing on Mongolian cultural identity often cite horn motifs as simple symbolic labels, without exploring how their internal composition logic constructs and conveys group identity in practice. By integrating semiotic analysis and ethnographic field data, this research establishes an analytical framework with both rigorous graphic interpretation and realistic social grounding.

The paper is divided into six core sections. Section 2 sorts out existing research achievements covering social semiotics, indigenous knowledge education and Mongolian decorative art research. Section 3 elaborates the mixed-method research framework combining visual content coding and field ethnography. Section 4 sorts out the four-tier formal structural logic of horn motifs based on relic sample analysis. Section 5, the core analytical chapter of this paper, interprets the social and educational value of each structural tier supported by interview records and field observation notes. Section 6 discusses the practical enlightenment of this research for indigenous cultural education and cultural identity protection, followed by the overall research conclusion.

2. Literature Review

2.1 Social Semiotics and Visual Symbolic Logic

Social semiotics lays the theoretical foundation for interpreting decorative graphics as meaning-generating systems instead of passive decorative attachments. Building on Saussure's structural linguistics, Halliday (1978) constructed a social semiotic research perspective, arguing that all language forms serve as semantic creation carriers under specific social contexts, and internal grammatical rules reflect and consolidate the core cultural values of user groups. Kress & van Leeuwen (2006) expanded this theoretical system to visual communication research, verifying that pictures carry independent symbolic logic equivalent to text language, and graphic layout rules record social power relations and ethnic cultural cognition.

The theoretical concept of visual symbolic logic has been widely adopted to analyse various native decorative systems. Prior research on West African woven cloth patterns (Adjaye, 2019), Māori facial tattoo symbols (Mead, 2003) and Northwest Coast aboriginal line decorative art (Holm, 2017) all confirm that seemingly decorative graphics follow fixed generative rules carrying kinship labels, status

markers and cosmic cognition. Such studies provide methodological references for interpreting native decorative patterns as structured symbolic systems with basic semantic units, deformation rules and integral layout logic. However, social semiotic interpretation targeting Central Asian nomadic decorative graphics remains scarce; most existing documents only adopt art history descriptive sorting rather than deep semantic decoding.

2.2 Indigenous Knowledge Education and Cultural Identity Construction

Academic research on indigenous education has gradually reached a consensus: ethnic cultural wisdom is not only passed down through verbal teaching, but also embedded in physical craft operations, visual symbols and embodied practical experience. Battiste (2013) pointed out that indigenous knowledge systems feature holism, environmental relevance and localisation, requiring multi-sensory and practice-oriented educational modes to help learners absorb core cultural connotations. Smith (2021) further emphasised that decolonised education must take native local epistemology as the core, including visual and material cultural knowledge long marginalised by modern school text-based teaching.

Art-integrated teaching has become an effective path to inherit indigenous cultural wisdom. Greenwood (2017) noted that creating and appreciating traditional visual art enables students to grasp implicit cultural meanings hard to express through words, building intimate emotional connections with ancestral civilisation. Within Mongolian cultural research, Batbold et al. (2026) and Tserendulam (2023) recorded the informal educational value of traditional handcraft production, yet neither study systematically analysed the instructional potential of horn motif internal symbolic logic.

Hall (1996) studied the construction mechanism of cultural identity through visual symbols, defining identity as a dynamic production process rather than fixed inherent traits, continuously shaped by daily cultural practices and symbolic carriers. For nomadic groups whose identity is bound to migratory lifestyles and physical handicrafts, decorative graphics play a decisive role in maintaining collective cultural identity among scattered populations. Even so, the internal correlation between visual symbolic logic and group identity formation lacks systematic theoretical sorting in Central Asian ethnic research.

2.3 Research Status of Mongolian Horn Motifs

Current academic research targeting Mongolian horn motifs can be split into three distinct research orientations. The first type is encyclopaedic classification research, represented by Amurbatu (2008) and Ulanjie (2013). Such documents systematically sort out all types of horn motifs and establish basic image archives, providing indispensable original materials for follow-up empirical research. Nevertheless, such classification research only stays at morphological sorting, without exploring generative composition rules or social semantic value of graphics.

The second orientation adopts cultural anthropology and art history analysis perspectives. Liang (2005), An (2023) and He (2013) decode the symbolic connotation of horn motifs, linking graphic forms to livestock prosperity wishes, shamanic cosmic beliefs and integrated Buddhist culture. While rich in cultural background information, these studies treat each graphic symbol as a static carrier with fixed meanings, ignoring that diverse composition combinations generate dynamic semantic differences in different usage scenarios.

The third emerging research path applies digital computing and parametric design to horn motif analysis. Chen & Li (2026) built mathematical models for digitising traditional decorative graphics; Zhang & Wang (2025) used fine-tuned latent diffusion AI models to realise high-fidelity generation of Mongolian folk patterns. Chen (2025) and Liu & Wang (2024) introduced shape grammar theories to innovate modern design based on partial horn motif categories. Such research verifies the strong generative potential of horn motif systems, yet focuses merely on technical design application without exploring their social semantics and educational functions.

2.4 Identified Research Gaps

Three obvious research blanks exist in existing academic documents. First, no published research systematically sorts out the complete four-tier symbolic structure of Mongolian horn motifs covering semantic units, deformation rules, composite combination and integral layout supported by large-scale craft relic sample analysis. Second, empirical research linking the formal structural logic of horn motifs with its three core social values—group identity marking, ecological wisdom recording and cultural inheritance teaching—remains absent. Third, the feasibility and implementation path of integrating horn motif symbolic logic into formal indigenous cultural curricula have never been discussed in previous studies. This paper fills all three research blanks through integrated social semiotic decoding and on-site ethnographic research.

3. Research Methodology

3.1 Overall Research Framework

This paper adopts sequential explanatory mixed-method research design, combining quantitative visual graphic coding analysis and qualitative field ethnographic research. The framework is divided into two independent research phases with mutual data verification. Phase One systematically records the formal structural characteristics of horn motifs through visual coding of museum collections and field-collected craft relics; Phase Two interprets the social and instructional connotations of such structural features relying on semi-structured interviews and participant observation with craft inheritors. The integration of two phases breaks through the limitation of single formal description and supports social-oriented deep interpretation of decorative graphics.

3.2 Sample Selection and Data Collection

The visual coding research sample covers 167 horn motif craft relics collected from four channels: 71 pieces from Inner Mongolia Museum permanent collections, 27 textile cultural relics from Wudangzhao Monastery archive, 37 handmade craft samples collected from Hohhot Saishang Ancient Street studios, plus 32 domestic daily craft pieces recorded on-site in Zhenglan Banner and Xilingol League pastoral households. The sample balances high-standard sacrificial ritual supplies and ordinary daily handmade products, covering all mainstream usage scenarios of horn motifs. All relics were shot under unified light conditions and converted into scalable vector graphics for precise morphological measurement and decomposition coding.

Ethnographic qualitative data were collected through 18 one-on-one semi-structured interviews, including 12 professional hereditary craft inheritors and 6 shamanic & Buddhist ritual culture practitioners. All interviews were completed in Mongolian with assistance from bilingual research assistants. Interview topics covered inheritors' cognition of horn motif symbolic meanings, personal craft learning experience, traditional oral teaching modes and perceptions of contemporary cultural inheritance crisis. Each interview lasted 60–90 minutes, with audio recording permitted by interviewees after signing informed consent forms; all recording content was fully transcribed for subsequent thematic coding analysis. The research team also completed on-site observation records for six craft creation processes and three large-scale sacrificial rituals using horn motif handicrafts.

3.3 Data Analysis Procedures

Visual graphic coding analysis was carried out in four stages corresponding to the four-tier symbolic structure proposed in this paper. Stage One: semantic unit decomposition, extracting the smallest independent visual units carrying complete cultural connotations from all relic samples, and categorising units according to curvature, branch quantity and symmetry offset morphological parameters. Stage Two: deformation rule sorting, recording four core visual adjustment modes applied to basic semantic units: mirror flipping, central rotation, proportional scaling and linear repeated translation. Stage Three: composite combination analysis, summarising two modes of integrating multiple semantic units: affix matching and cross fusion. Stage Four: integral layout coding, extracting three mainstream integral arrangement modes for complete decorative areas, and matching each layout mode with corresponding craft carrier types and usage scenarios.

Qualitative interview transcription data adopted thematic coding analysis guided by social semiotic theoretical framework. Two independent researchers separately coded all text records, extracting core themes including group identity inheritance, ecological wisdom recording, traditional teaching modes and cultural cognition transformation; the inter-coder reliability coefficient Cohen's κ reached 0.87, meeting academic analysis standards. Finally, all coded qualitative themes were matched with

horn motif structural features summarised in Phase One to establish clear logical links between formal graphic structure and realistic social functions.

3.4 Research Ethical Specifications

All research implementation procedures passed the ethical review of the Research Ethics Committee of Universiti Sultan Zainal Abidin. All interviewees signed Mongolian-version written informed consent forms, retaining the right to terminate interview participation at any stage. On-site shooting of cultural relics in museum and monastery archives obtained official written usage permission. Indigenous cultural knowledge shared by interviewees is quoted with clear personal attribution where permitted; sensitive sacrificial symbolic content is anonymised to protect unique intellectual property rights of local pastoral communities.

4. Four-Tier Morphological Symbolic Structure of Mongolian Horn Motifs

Based on systematic visual coding analysis of 167 craft relic samples, this chapter sorts out the complete formal symbolic system of Mongolian horn motifs, divided into four progressive tiers: independent semantic units, inflectional deformation rules, composite combination modes and integral layout logic. This structural framework lays the data foundation for social and educational function interpretation in Chapter 5.

4.1 Tier One: Independent Visual Semantic Units

This paper defines visual semantic units as the minimum graphic units carrying independent cultural connotations; splitting such units will completely destroy their complete symbolic meaning. Sample analysis extracts three free semantic units that can independently form complete decorative graphics, plus three bound auxiliary units that cannot exist alone.

Free semantic units can serve as complete decorative elements without matching other graphics. Type C unit (f1) is a single one-way curved arc simulating sheep horn outlines, symbolising individual vitality and sustainable livestock abundance. Type S unit (f2) consists of two reverse C-shaped curves connected at the bottom, simulating paired animal horns and carrying symbolic meanings of complete families and balanced dualistic cosmic relations. Closed circular unit (f3) is formed by connecting multiple C-shaped curves end to end into continuous loops, recording cyclical seasonal rhythms and endless natural regeneration.

Bound auxiliary units cannot be used independently and must attach to free semantic units as supplementary decorative elements. Short line texture decoration (b1) adheres to the inner arc of horn graphics, simulating animal hair texture to enrich visual layering. Small grass scroll auxiliary pattern (b2) fills blank intervals between horn units, integrating grassland ecological imagery into horn motif systems. Geometric dot carving decoration (b3) mostly appears on silver metal craft surfaces, enhancing delicate carving texture without changing the core semantic connotation

of main horn graphics. Functionally, bound auxiliary units are equivalent to affixes in linguistics, only enriching visual expression without altering the core symbolic meaning of basic units.

4.2 Tier Two: Inflectional Graphic Deformation Rules

Inflectional deformation rules adjust the external form of basic semantic units while retaining their core cultural connotations, analogous to word inflection changes in text language. Four universal deformation adjustment modes are summarised from all relic samples. Mirror symmetry deformation flips basic units along vertical or horizontal axes to form paired horn graphic combinations, appearing in 61% of all relic samples, mostly applied to central decorative areas such as silver bowl covers and wooden cabinet panels. Central rotation deformation distributes semantic units around a fixed central point at 45°, 90° or 180° rotation angles, forming four-directional or eight-directional radial graphics suitable for circular craft carriers. Proportional scaling deformation adjusts unit size in equal proportions, using large graphics as core main patterns and miniaturised units to fill frame border areas. Linear translation repetition deformation copies semantic units along horizontal or vertical axes to form continuous strip decorative patterns for garment edges, saddle borders and yurt wooden frame edges.

4.3 Tier Three: Composite Graphic Combination Modes

Composite combination modes integrate multiple semantic units to form new compound graphics, simultaneously enriching visual complexity and multi-layered symbolic connotations. This paper divides combination modes into two core categories. Affix matching combination connects one free semantic unit with multiple bound auxiliary units. For example, matching Type S horn unit with grass scroll auxiliary pattern (f2+b2) forms composite grass-horn graphics, simultaneously conveying dual ecological connotations of livestock breeding and grassland survival. Cross fusion combination splices two or more free semantic units through curve overlapping; the combination of Type C horn unit and closed circular unit generates horn-cloud compound patterns, widely used on wooden furniture and carved saddle surfaces to stack multiple layers of cultural symbolism within a single decorative area.

4.4 Tier Four: Integral Layout Logic of Complete Decorative Areas

Integral layout logic regulates the overall arrangement mode of compound graphics in a full decorative space, corresponding to sentence-level grammar in written language. Three mainstream integral layout paradigms are extracted from samples, each matching specific craft carrier types and spatial usage environments. Central symmetrical layout arranges all compound graphics around a fixed central axis or central point to form balanced independent decorative blocks, suitable for small-area independent carriers including leather buckles and wooden storage box panels. Two-way continuous layout repeats compound graphics along horizontal or vertical linear

axes to form long strip border patterns for garment edges and harness accessory strips. Radial cluster layout distributes multiple deformed compound graphics in concentric circles around a central core, matching circular carriers such as yurt dome inner decoration, silver bowl bottoms and round silver pendants. The three layout modes can operate independently or form nested structures; for instance, a central radial core pattern is wrapped by continuous linear border graphics to form complete multi-layer decorative systems.

Table 1 Statistical Summary of Four-Tier Horn Motif Symbolic Structure (Sample N=167)

Symbolic Structural Tier	Core Units & Deformation Modes	Sample Occurrence Ratio	Main Matching Craft Carriers
Independent Semantic Units	Free units f1/f2/f3; bound auxiliary units b1-b3	100% (all relics carry at least one free unit)	All horn motif craft products
Inflectional Deformation Rules	Mirror, rotation, scaling, linear translation	Mirror:61%, translation:23%, rotation:11%, scaling:5%	Silver craft, wood carving, leather craft, embroidery
Composite Combination Modes	Affix matching (free+bound), cross fusion (multi-free units)	Affix matching:68%, cross fusion:32%	Household furniture, saddles, sacrificial textiles
Integral Layout Logic	Central symmetry, linear continuity, radial cluster	Central symmetry:52%, linear continuity:31%, radial cluster:17%	Small independent surfaces, border decoration, circular carriers

5. Social and Instructional Value of Horn Motif Symbolic Structure

This chapter forms the core innovative analysis content of this paper. Supported by interview records and field observation notes, it interprets how each tier of horn motif symbolic structure undertakes unique social communication and cultural teaching functions, linking abstract graphic structural rules with the real cultural practice of Mongolian herding communities.

5.1 Semantic Unit Selection and Clan Group Identity Labelling

The choice of different free semantic units is not determined by subjective aesthetic preference, but serves as a visual marker recording different levels of social identity. Interview data reflect that Type C single horn units are mostly applied to personal daily supplies belonging to individual family members, while Type S paired horn units dominate craft products used in family gatherings and clan sacrificial ceremonies. An elderly craft inheritor from Zhenglan Banner stated in an August 2023 interview: “Single horn patterns decorate one person’s saddle, yet double horn graphics belong

to the whole family—they symbolise matched livestock herds and intact kinship groups.” This differentiation constructs a visual symbolic system distinguishing individual and collective social attributes: viewers can rapidly judge the ownership and usage scenarios of craft products only through identifying basic graphic units.

Closed circular units (f3) almost exclusively appear on sacrificial textiles and ancestral worship supplies, marking such carriers as sacred ritual supplies separated from daily domestic use. The fixed matching relation between semantic unit types and social scenarios forms an intuitive non-verbal classification system, enabling community residents to quickly recognise the ritual attribute, ownership and applicable crowd of craft products through visual observation.

Bound auxiliary units carry more subtle regional cultural marking information. Grass scroll auxiliary patterns (b2) have a significantly higher occurrence ratio on craft products produced in eastern Inner Mongolia grassland areas relying on animal husbandry, while geometric dot carving decorations (b3) are concentrated on silver craft works from western pastoral areas. Such regional differentiated matching rules act as visual dialect characteristics of horn motif symbolic systems, allowing experienced craft practitioners to judge the producing region and sub-cultural background of handicrafts through auxiliary unit selection, forming a unique visual identification system of ethnic regional subgroups.

5.2 Graphic Deformation Rules and Nomadic Ecological Wisdom Recording

Four inflectional deformation modes condense core ecological cognition formed by long-term nomadic production life. Mirror symmetry deformation, the most widely applied rule, visualises the dual balance philosophy deeply rooted in Mongolian pastoral culture: alternating summer and winter grazing lands, balanced male and female social roles, interdependent relations between humans and livestock. Symmetrical graphics generated by mirror deformation intuitively express the ecological balance concept that herding production strives to maintain.

Central rotation deformation directly records cyclical seasonal operation logic. Four-directional and eight-directional radial graphics formed by rotation correspond to four seasons and eight fixed seasonal migration nodes that constitute the complete nomadic annual cycle. A craft training instructor explained in a June 2024 field interview the inherent link between rotation rules and seasonal education: “When horn graphics spread outward in eight directions, teenagers can learn eight fixed livestock migration cycles—spring pasture transfer, summer grazing settlement, all seasonal rules are hidden in this graphic form.” This fully proves that graphic deformation modes are not pure formal decorative techniques, but compressed visual carriers of seasonal ecological knowledge readable for community residents mastering horn motif symbolic logic.

Proportional scaling deformation records internal hierarchical relations of society through graphic size differences. In complete composite decorative areas, the largest

semantic unit always represents the highest-status symbolic element—whether clan totem marks, sacrificial sacred symbols or core leading livestock of herds. Horn motif symbolic systems reproduce social stratification through proportional size relations of graphics, enabling viewers to understand community power order and relative status differences only through observing graphic layout proportions.

5.3 Composite Combination Modes and Multi-Layer Cross-Generational Knowledge Inheritance

Composite graphic combination modes support stacking multiple types of cultural wisdom within a single decorative area. Affix matching combining horn main units and grass scroll auxiliary patterns forms compound grass-horn graphics, simultaneously recording two inseparable core livelihood elements of pastoral society: livestock breeding and grassland ecological survival. Teenagers learning to draw such composite graphics naturally understand the interdependent relation between livestock and grasslands; the operation of embedding grass auxiliary patterns into horn graphics visually reproduces the ecological symbiosis concept of nomadic civilisation.

Cross fusion combination splicing multiple free semantic units realises the integration of multi-source cultural wisdom. Compound graphics combining horn units with cloud scroll or lotus patterns reflect the multi-layer cultural integration history of Mongolian society, merging primitive shamanic belief, introduced Buddhist culture and northern Chinese decorative aesthetic traditions. The fusion function of horn motif symbolic systems provides a formal carrier for absorbing new cultural elements while retaining core horn graphic logic, recording the long-term cultural syncretism history of Mongolian visual art.

From an instructional perspective, composite combination modes form a naturally progressive craft learning system. Novice young learners first practice drawing single free semantic units, then gradually add bound auxiliary units for affix matching creation, and only master cross fusion compound graphics after long-term skill accumulation. This learning sequence matches the cognitive development logic from basic single cultural concepts to complex multi-layer integrated wisdom, forming an indigenous natural curriculum hidden in traditional craft inheritance.

5.4 Integral Layout Logic and Spatial-Social Ethical Order

Three integral layout paradigms correspond to distinct spatial ethics and social operation norms within Mongolian cultural systems. Central symmetrical layout, widely applied to independent personal craft products, reflects the individual-centred attribute of personal belongings and family ancestral altars. The central symmetry axis of graphics corresponds to the central hearth of yurt living spaces and the core patriarchal lineage of kinship groups, materialising the centralised order of traditional pastoral family society.

Two-way linear continuous layout used for craft border decoration symbolises endless continuity, a core cognitive concept of nomadic culture: grasslands are boundless without fixed dividing lines, and clan kinship inheritance forms an unbroken cross-generational chain. The repetitive linear rhythm of continuous border graphics visually expresses the eternal continuity of cultural inheritance that pastoral communities strive to maintain across generations.

Radial cluster layout applied to circular and domed craft carriers reproduces the concentric spherical cosmic model of Mongolian shamanic belief: the central graphic core represents the world axis and spiritual sacred centre, with horn graphics radiating outward layer by layer to express multi-layer cosmic hierarchical structures. When applied to yurt dome decorative parts, radial layout integrates residential architecture into complete cosmic cognition systems, turning daily living spaces into implicit teaching carriers for inheriting traditional cosmic worldviews.

5.5 Horn Motif Creation Practice as Informal Cultural Education Carrier

All interview records consistently verify that learning to draw and interpret horn motifs constitutes a complete indigenous informal educational system. Local children start observing female relatives completing embroidery and carving craft production at ages 5–7. By 10–12 years old, most adolescents can accurately distinguish three basic free semantic units and explain their core symbolic connotations. Mastering complex graphic deformation rules and composite combination skills usually takes the whole adolescent stage, mostly through long-term apprenticeship learning with skilled elder relatives.

Crucially, this learning process transmits far more than simple handcraft operation skills. One senior craft inheritor shared in a July 2024 interview: “When young girls learn to draw horn motifs, they simultaneously learn reasonable livestock breeding scales, seasonal migration rules and ancestral behavioural norms—each graphic pattern itself is a cultural lesson.” The four-tier symbolic structure of horn motifs naturally forms a graded cultural curriculum; each stage of skill mastery corresponds to deeper absorption of pastoral ecological ethics, clan social norms and traditional cosmic cognition.

The collapse of this traditional informal teaching system is a shared concern of all interviewed inheritors. Twelve out of eighteen interviewees mentioned that teenagers under 15 years old in local communities cannot accurately distinguish horn motif types or explain their symbolic connotations. The loss of such visual symbolic literacy is not merely a disappearance of folk aesthetic skills, but a fracture in the inheritance channel of indigenous ecological and social wisdom, posing direct threats to the maintenance of youth cultural identity in modern pastoral communities.

6. Discussion

6.1 Horn Motifs as a Complete Social Semiotic Symbolic System

Research outcomes confirm that Mongolian horn motifs form a fully mature social semiotic system, where formal graphic structural rules and realistic social symbolic connotations are inseparably bound. This research expands the visual symbolic logic theory proposed by Kress & van Leeuwen (2006) into Central Asian nomadic cultural research, verifying that rule-based visual symbolic languages are not exclusive to literate civilisations, but universal core carriers of indigenous knowledge sorting and transmission. The four-tier symbolic framework summarised in this paper—basic semantic units, inflectional deformation, composite combination and integral layout—has parallel structural logic with text language grammar, proving that human beings' ability to construct rule-based symbolic systems covers multiple communication modalities beyond written text.

This research also supports Hall's (1996) dynamic construction theory of cultural identity. Horn motifs do not passively reflect pre-existing Mongolian group identity; instead, they continuously create and consolidate group identity through fixed graphic selection and layout rules that mark clan belonging, regional origin, ritual status and ecological cognition. The horn motif visual symbolic system acts as a dynamic identity construction tool, continuously shaping internal social classification standards and cultural boundary cognition through daily craft creation and usage practice.

6.2 Practical Enlightenment for Indigenous Cultural Education

The discovery that horn motifs carry inherent graded instructional logic provides clear implementation references for formal indigenous cultural courses in Inner Mongolia and Mongolian Plateau regions. Current local school cultural curricula only contain superficial appreciation content of traditional folk art, treating horn motifs as static aesthetic works without explaining their internal symbolic grammar and knowledge-carrying functions. This research proposes embedding horn motif symbolic logic into interdisciplinary formal courses, simultaneously supporting visual literacy training, ethnic cultural history teaching, grassland ecological science popularisation and geometric mathematics education through analysing graphic deformation rules.

Such interdisciplinary teaching paths conform to Battiste's (2013) indigenous holistic education framework centring local environmental relevance and multi-sensory practice. Organising students to decompose, create and interpret horn motifs enables schools to carry out indigenous cultural inheritance education rooted in local ethnic backgrounds, forming complementary relations with standard school textbook knowledge. The progressive difficulty inherent in horn motif four-tier symbolic structure also supports differentiated teaching design matching students of different age groups.

This research further promotes the decolonisation transformation of ethnic education proposed by Smith (2021), fully proving that indigenous visual symbolic systems carry equivalent rigorous analytical logic and graded teaching value as text-based academic disciplines. Defining horn motifs as teachable symbolic grammar rather than primitive decorative patterns recognises the systematicity of indigenous local epistemology, breaking the biased hierarchy that regards text-based written knowledge as the only authoritative formal academic content.

6.3 Research Limitations and Follow-Up Research Directions

Several objective limitations restrict the generalisation scope of this research conclusion. The visual coding sample is mainly collected from Inner Mongolia cultural institutions and pastoral households, lacking sufficient relic samples from western Mongolian Plateau and Buryatia regions, failing to fully record cross-regional differentiated characteristics of horn motifs. Although interview records contain rich qualitative information, the sample size of 18 inheritors cannot cover all community groups with different cultural backgrounds, possibly omitting diverse local cognitive perspectives on horn motifs. In addition, this research independently analyses horn motifs as a single symbolic category; follow-up research needs to explore the matching combination relation between horn motifs and other Mongolian decorative systems including nose scroll patterns and grassland scroll graphics in complete decorative areas.

Future research can expand in three directions. First, design controlled classroom teaching experiments to test the actual teaching effect of horn motif symbolic curriculum materials and provide practical data support for ethnic education reform. Second, develop graded age-adaptable teaching manuals centred on horn motif symbolic logic, forming operable teaching resources for primary and secondary indigenous cultural courses. Third, carry out cross-cultural comparative research with other nomadic ethnic decorative systems including Kazakh harness patterns and Tibetan textile graphics, sorting out universal and ethnic-specific characteristics of grassland nomadic visual symbolic languages.

7. Conclusion

This research verifies that Mongolian horn motifs constitute a complete social symbolic language system, whose internal formal structural rules are inherently connected with Mongolian pastoral community group identity construction, ecological wisdom recording and cross-generational cultural inheritance practice. Through visual coding analysis of 167 craft relics and depth ethnographic interviews with 18 professional cultural inheritors, this paper summarises a four-tier complete symbolic framework: three independent and three auxiliary visual semantic units, four inflectional graphic deformation adjustment rules, two composite graphic combination modes and three integral decorative area layout paradigms.

Every tier of this symbolic system undertakes unique social and instructional functions. Selecting different basic semantic units forms intuitive visual markers distinguishing individual and clan identity; graphic deformation rules condense core nomadic ecological cognition covering seasonal cycles and social hierarchy; composite combination modes realise multi-layer stacking of cross-source cultural wisdom and naturally progressive craft learning logic; integral layout paradigms materialise traditional spatial ethics and shamanic cosmic hierarchical models. Mastering the creation and interpretation of horn motifs forms a complete informal indigenous education channel, through which adolescents simultaneously absorb pastoral production ethics, kinship operation norms and traditional cosmic worldviews alongside handcraft technical skills.

The continuous decline of traditional horn motif oral inheritance channels leads to irreversible loss of indigenous nomadic knowledge systems. By reinterpreting horn motifs as a teachable complete social symbolic grammar, this paper constructs an operable theoretical framework for embedding native visual cultural resources into formal ethnic education courses, providing a culturally rooted solution to sustain nomadic civilisation wisdom amid rapid socio-economic transformation. The analytical paradigm established in this paper—linking formal visual symbolic structure with social communication and educational functions—can be transplanted to interpret visual decorative systems of other indigenous ethnic groups, supporting global academic efforts to sort out, revitalise and inherit diverse local native knowledge traditions.

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