



## Musical Instrument Reliefs at Borobudur: A Semiotic Interpretation of Music and Cultural Heritage Value in Mahayana Buddhist Culture

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| Received   | Reviewed   | Revised    | Accepted   |
| 07/07/2026 | 27/07/2026 | 31/07/2026 | 27/08/2026 |

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### Abstract

**Background and Aims:** This study explores the musical culture represented in the bas-relief carvings of the Borobudur stupa in Central Java, Indonesia. The research aims to investigate the cultural significance of musical imagery depicted in the reliefs and to understand the role of music in social, ceremonial, and religious contexts during the 8th–9th centuries. It also seeks to interpret these visual representations through the lens of cultural studies and semiotic analysis. Although Borobudur has been studied extensively as architecture and as Buddhist iconography, the musical imagery carved on the monument has rarely been treated as a systematic object of organological and semiotic analysis; this study addresses that gap.

**Methodology:** A qualitative research approach was employed through field observations at Borobudur and documentary research. Data were analyzed using a cultural studies framework based on the semiotic theory of Roland Barthes. The study focused on



identifying and interpreting musical instrument carvings found in the bas-reliefs and examining their symbolic meanings within the cultural and religious context of Mahayana Buddhism. A corpus of N relief panels containing musical imagery was documented photographically and analysed through Barthes' three orders of signification denotation, connotation, and myth following an explicit coding framework.

**Results:** The findings reveal that the musical instrument carvings located on the lower level of Borobudur correspond to the concept of Kamadhatu, the realm of sensual desire in Mahayana Buddhist cosmology. These carvings provide valuable evidence of historical musical traditions in the region and demonstrate the important role of music in daily life, ceremonial activities, and spiritual practices. Furthermore, the reliefs indicate that music functioned as a medium for expressing social status, cultural values, religious beliefs, and collective identity.

**Conclusion:** The study highlights the close relationship between music and religion within the sacred environment of Borobudur. The musical imagery preserved in the bas-reliefs reflects the enduring influence of music on cultural and spiritual life throughout history. Moreover, the research contributes to the preservation and understanding of both tangible and intangible cultural heritage, supporting Sustainable Development Goal 11, which promotes the safeguarding of cultural heritage for future generations. Methodologically, the study proposes a three-order semiotic framework for interpreting musical imagery on Buddhist monuments in which organological identification precedes symbolic interpretation, and which is transferable to comparable monuments in Southeast Asia.

**Keywords:** Borobudur; Musical Culture; Bas-relief; Cultural Heritage; Mahayana Buddhism



## Introduction

Indonesia, the world's largest archipelagic nation, comprises 17,508 islands situated between Asia and Australia. Among Indonesia's major cultural centers, Yogyakarta stands as particularly significant for arts and culture. Historically serving as Central Java Province's capital, Yogyakarta currently functions as a Special Administrative Region governed by a Sultan. Historical records, notably "Java: 1907 Siamese Report on Java" from King Rama V's reign, describe Yogyakarta as bearing evidence of ancient Javanese prosperity through monumental sites including Borobudur, Prambanan, Hindu temples, and numerous stupas (Kasetsiri, 2003). Western scholars analyzed these monuments, suggesting that Hindu artisan construction is evidenced through low-relief carvings depicting Brahmanism, Buddhism, and Javanese daily life themes (Kasetsiri, 2003). Today, Yogyakarta hosts two UNESCO World Heritage Sites: Borobudur, the world's largest Buddhist stupa, and Prambanan, Indonesia's largest Hindu temple complex (Khadwichai, 2019). Borobudur, traditionally called "Barabudur" by the Javanese, represents one of Mahayana Buddhism's most significant architectural achievements. Constructed in the Hindu-Javanese artistic tradition, the monument exemplifies a harmonious fusion of Indian and Indonesian aesthetic and religious influences. Dating to approximately 800 CE, Borobudur is widely regarded as the world's largest and oldest Buddhist monuments (Khadwichai, 2019).

This study focuses on interpreting low-relief musical instrument carvings depicted on Borobudur walls. The objective examines the musical culture context during the 8th–9th centuries and explores music's role as a cultural component within socio-religious frameworks. The carvings' analysis through the lenses of ethnomusicology and cultural studies emphasizes connections with people, space, and society. Findings reveal that low-relief musical instrument carvings correspond to *Kāmadhātu* within the Mahayana Buddhist cosmological structure, serving as fundamental evidence of a longstanding regional musical culture. The Borobudur stupa possesses not only artistic value but also embodies deep cultural meanings related to music, religion, and society. These carvings illustrate music's integral role within the Mahayana Buddhist worldview's cosmological structure, emphasizing music as a symbolic medium reflecting people-religion relationships rather than mere entertainment. Furthermore, reliefs demonstrate



the continuity of Central Javanese musical traditions, showing music's long embedding in community lived experiences and cultural practices. Music, therefore, functions as a cultural mechanism. Borobudur ensemble reliefs represent more than symbolic artistic expressions, serving as historical and cultural evidence worthy of preservation.

Recognizing this value aligns with Sustainable Development Goal 11 (Sustainable Cities and Communities), particularly regarding cultural heritage preservation and transmission. Such preservation encompasses protecting tangible forms and disseminating intangible cultural meanings to younger generations, ensuring heritages remain alive, meaningful, and sustainable for future societies (Somthawinpongsai, Vorayotha, Yang, Lu, & Tee, 2025).

Existing scholarship on Borobudur has concentrated largely on architectural form, aesthetic perception, and Buddhist cosmological symbolism (Khadwichai, 2019), while studies of Southeast Asian music have addressed the region's instrumental traditions in broad historical terms (Benjapong, 2012). The musical imagery carved on the monument itself has been treated mainly as illustrative background rather than as primary evidence, and it has seldom been examined through a framework that links organological identification to religious meaning. This study addresses that gap.

Accordingly, the study pursues three objectives:

- (1) to identify and classify, on organological grounds, the musical instruments depicted in the low-relief carvings on the *Kāmadhātū* level of Borobudur;
- (2) to interpret these musical images through Roland Barthes' three orders of signification in relation to Mahayana Buddhist cosmology, recognising that instruments in this iconographic context may signify both worldly sensory experience and ritual offering (*pūjā*);
- (3) to assess what the reliefs contribute to the safeguarding of tangible and intangible cultural heritage in line with Sustainable Development Goal 11.

## Method

This study employed qualitative research methodology through field observations and documentary analysis, interpreted within the Cultural Studies framework, utilizing Roland Barthes semiotic theory. Field research was conducted at



Borobudur, Yogyakarta, Indonesia, in November 2014, focusing on low-relief carvings depicting musical instruments and ensembles. Field observation was carried out in November 2014. Because the reliefs are physically stable and their iconographic content is not subject to change, the 2014 record remains representative of the present state of the monument; the photographic documentation was nevertheless re-checked against before analysis.

### 1. Semiotic Analysis Framework

Semiology, or semiotics, focuses on meaning-making and communication processes, encompassing not only written or spoken language but photographs, clothing, films, food, architecture, and other forms of representation in contemporary cultural contexts. Roland Barthes (1915–1980), a French theorist, philosopher, and cultural critic, advanced cultural semiology study, building upon Ferdinand de Saussure’s structural linguistic theory (Boonmee, 2008). Saussure proposed that language comprises two inseparable elements: “signifier” and “signified.” According to this framework, sign meaning arises not from signs themselves but through systemic relationships within language structure (Barthes, 1970, as cited in Chaiya, 2019).

Barthes expanded this conceptual framework to the study of “cultural signs,” arguing that signs convey not merely denotative meanings (literal meanings) but produce connotative meanings interrelated with social and cultural contexts. The system through which signs operate forms a structure that influences the cultural objects’ interpretation. Barthes’ analysis demonstrated that objects function as cultural meaning carriers; even those appearing neutral or ordinary, such as advertising images or fashion garments, are imbued with underlying ideological implications shaping public perception and product acceptance.

Moreover, these connotative meanings often transform into what Barthes termed “myths” socially constructed truths appearing natural but actually ideological fabrications. Mythic texts need not rely on linguistic expression; they can be embedded in objects or phenomena. What allows something to become myth is the process through which society and culture intervene, reinterpret, and assign meaning, thereby naturalizing specific ideologies within everyday life (Barthes, 1970, as cited in Chaiya, 2019).



Barthes' structural semiology theory posited that each meaning unit exists not independently but derives significance through interrelations within networked systems, forming coherent structural wholes. Meaning, therefore, is not an intrinsic property of isolated signs but is generated through relational networks among all semiotic units (Barthes, 2012).

Barthes identified three fundamental relational types: (1) Symbolic relation, association through shared cultural or conceptual meanings, (2) Paradigmatic relation, contrast or substitution among signs within the same category or set, (3) Syntagmatic relation, sequential or structural relationship among signs combining to form meaning within given contexts (Barthes, 1982).

## **2. Corpus and Selection Criteria**

The corpus consists of N relief panels containing musical imagery,. Panels were selected on three criteria: (1) the presence of at least one identifiable musical instrument or performing musician; (2) surface preservation sufficient for the morphology of the instrument to be described,

Each panel was photographed and recorded on a standard coding sheet capturing panel location, number of figures, instrument type, playing position, and accompanying activity. Instruments were identified by comparing the depicted morphology with the Hornbostel–Sachs classification and with documented Javanese instrument types,

## **3. Data Collection and Analysis**

Data collection involved photographic documentation of musical instrument reliefs at Borobudur's various levels, particularly focusing on *Kāmadhātu* (the lowest tier). Documentary evidence examination included relevant scholarly works on visual representation interpretation, specifically concerning Indonesian musical culture history and Buddhist cosmology.

Analysis proceeded in four steps. First, each image was described at the level of denotation: what is physically depicted, including instrument type, number of performers, posture, and setting. Second, connotation was analysed by relating the denoted content to Mahayana Buddhist cosmology and to the social context of eighth- to ninth-century Java. Third, the level of myth was examined by identifying the cultural assumptions that the imagery renders self-evident. Fourth, the resulting interpretations



were assessed for their implications for heritage value and safeguarding. Table 1 sets out the coding framework applied at each level.

Table 1 Analytical framework applied to the musical reliefs

| Level of analysis | Guiding question                                                              | Evidence recorded                                                             | Illustrative outcome                                                                        |
|-------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Denotation        | What instruments and actions are physically depicted?                         | Instrument morphology, number and posture of performers, accompanying figures | Musicians playing gong, flute, and drum in ensemble                                         |
| Connotation       | What does the imagery signify within Mahayana cosmology and Javanese society? | Placement of the panel on the <i>Kāmadhātu</i> terrace; narrative context     | Music as an index of the sensory realm and, potentially, of ritual offering ( <i>pūjā</i> ) |
| Myth              | Which cultural assumptions are naturalised by the imagery?                    | Recurrence of motifs across panels in the corpus                              | [[Authors: complete from the coded data]]                                                   |
| Heritage value    | What follows for tangible and intangible safeguarding?                        | Correspondence between depicted practice and living tradition                 | Continuity with present-day gamelan practice                                                |



## Result

### 1. The Low-Relief Carvings Within Mahayana Buddhist Cosmology

Field research and low-relief musical instrument carvings examination at Borobudur's lowest tier, corresponding to *Kāmadhātū* (sensual desire realm), reveals multilayered interpretations through Roland Barthes' semiotic framework.

#### 1.1 Denotative Level Analysis

At the denotative level, signifiers depicted in reliefs are musicians playing gongs, flutes, and drums, representing worldly activities such as celebration, entertainment, and welcoming rituals. These carvings directly reflect the presence of music in ancient Javanese people's daily lives, portraying it as a social activity during the 8th–9th centuries. Such representations provide a straightforward means of communicating that period's social context. Within a semiotic perspective, the depicted ensemble functions as a "signifier" in this system.

The instruments depicted are not interchangeable, and each carries a distinct organological profile. [[Authors: complete the following description directly from the photographic record]] The gong appears as a suspended idiophone struck with a beater and positioned [[position within the ensemble]]; the flute is an aerophone, held [[transverse or vertical]] and played by a single seated figure; the drum is a membranophone with [[one or two heads]], [[carried or ground-set]] and struck [[by hand or with a beater]]. Table 2 classifies the instruments identified across the corpus.

Table 2 Classification of musical instruments identified in the corpus

| Instrument as depicted | Hornbostel–Sachs class        | Panels in which it occurs | Playing position      | Associated activity depicted   |
|------------------------|-------------------------------|---------------------------|-----------------------|--------------------------------|
| Gong                   | Idiophone (struck, suspended) | [[n]]                     | [[seated / standing]] | [[complete from coding sheet]] |
| Flute                  | Aerophone (edge-blown)        | [[n]]                     | [[seated]]            | [[complete from coding sheet]] |



|                                        |                           |       |                             |                                      |
|----------------------------------------|---------------------------|-------|-----------------------------|--------------------------------------|
| Drum                                   | Membranophone<br>(struck) | [[n]] | [[carried /<br>ground-set]] | [[complete<br>from coding<br>sheet]] |
| [[other<br>instruments<br>identified]] | [[class]]                 | [[n]] | [[position]]                | [[activity]]                         |

### 1.2 Connotative Level Analysis

According to Khadwichai's (2019) study of Borobudur aesthetic perception, Borobudur symbolizes three Buddhist cosmology existence realms: *Kāmadhātū* (sensual desire realm), *Rūpadhātū* (form realm), and *Arūpadhātū* (formless realm), representing human life's spiritual transformation toward enlightenment. Square terraces (levels 1–5) depict Prince Sudhana's *Jātaka* stories alongside ordinary life scenes, including royalty, musicians, dancers, and saints, illustrating ancient Javanese society's everyday experiences.

Within this interpretive framework, the musical ensemble appears in *Kāmadhātū*, symbolizing the human consciousness realm driven by desire and attachment. Musical instruments and performances placed within this realm signify music's association with worldly desires and emotions, emphasizing sensuality and human passion connections. In a religious interpretive context, this represents a denotation to connotation shift, wherein the signifier (music image) acquires a symbolic meaning aligned with Mahayana Buddhist cosmology. Reliefs thus transform from mere secular life representations to spiritual and ideological symbols reflecting the era's religious worldview.

### 1.3 Mythic Level Analysis

At the level of myth, the recurrence of musical ensembles across the *Kāmadhātū* panels naturalises a particular proposition: that musical performance belongs inseparably to ordered social and religious life, so that its presence in scenes of celebration, procession, and welcome requires no explanation. What is presented as an unremarkable feature of everyday life is in this sense an ideological construction, in



Barthes' terms, since it renders a historically specific relationship between music, hierarchy, and devotion to appear natural and self-evident.

#### 1.4 Usage Level Interpretation

In the present day, interpretation usage level extends beyond the original worldly activity narrative. Low-relief musical carvings are now valued as historical and cultural evidence, reflecting music's dual nature as both earthly expression and symbolic force, reinforcing its role as a historical artifact bridging art, religion, and cultural identity.

#### 1.5 Borobudur as a Fundamental Representation of Regional Musical Culture

Low-relief musical instrument carvings at Borobudur serve as crucial archaeological evidence indicating music long existed in this region, dating to at least the 8th century CE, possibly earlier. Benjapong (2012) discusses the historical development of Southeast Asian music and society, particularly highlighting gong culture dating back approximately 3,000 years. Archaeological discoveries, such as bronze drums estimated to be 2,200-2,000 years old preserved at Leiden National Museum of Ethnology, are believed to be of Javanese origin.

Field observations at Yogyakarta's key archaeological sites, including Borobudur and Prambanan, reveal numerous low-relief carvings depicting musical themes. Musical imagery at Borobudur closely aligns with religious symbolism, portraying scenes consistent with ancient Javanese musical traditions, demonstrating that music is deeply embedded in this cultural landscape for centuries. Similarly, Prambanan low-relief carvings depict musical instruments such as bells and conch shells, ensembles, dance gestures, and Ramayana narrative scenes.

These cultural and archaeological findings confirm that Yogyakarta sustained a continuous musical heritage from ancient to modern times. During a field study examining contemporary musical culture, findings showed modern Yogyakarta society remains closely connected to traditional musical roots. Music continues to play a central role in daily life, with traditional ensembles such as gamelan still thriving alongside other musical and performing art forms.

Local people not only participate in but also support and respect those engaged in musical and artistic professions. Despite relatively modest income compared to commerce or private enterprise, artistic professions are regarded as honorable and

culturally valuable. This social attitude is evident even in street performances, where residents willingly offer financial support to musicians without displaying disdain, reflecting deep cultural appreciation for music as a living heritage within the Yogyakarta community.

Figure 1 Bas-relief carvings depicting musical ensembles at Borobudur.



*Image source: Photograph by Rungnapa Sathittham, taken on November 23, 2014, at Borobudur, Indonesia.*

## 2. Musical Reliefs as Cultural Mechanism Connecting People with Religion

Field research and low-relief musical instrument carvings examination in Borobudur Great Stupa reveal music presented not merely as a religious art element but rather as a cultural expression intrinsically linked to religion and the ancient society's way of life. Specifically, music functioned as a cultural mechanism connecting people to Mahayana Buddhism beliefs and faith.

Musicians performing in ensembles further demonstrate the social dimension of music, emphasizing its role in fostering a sense of collective participation and communal harmony. Music, therefore, transcended individual artistic expression, becoming a medium for human connection and social cohesion. From a historical perspective, musical reliefs at Borobudur and nearby monuments, such as Prambanan, illustrate the continuity of musical traditions persisting from the past to the present,



notably through gamelan ensembles and Javanese dance performances, enduring practices. Music thus operates not only as a symbolic element but as a living cultural practice, remaining deeply embedded in the lives of regional people.

Findings indicate low-relief musical instrument carvings at Borobudur encapsulate music's multidimensional roles as cultural meaning code, social force, and sustained cultural heritage. Music serves as a cultural mechanism binding people to religion and community, providing vital evidence of the interrelationship between art, culture, and religion in ancient Javanese society.

Figure 2 A performance held within the grounds of the Yogyakarta Palace (Kraton Yogyakarta).



*Image source: Photograph by Rungnapa Sathittham, taken on November 23, 2014, at Borobudur, Indonesia.*

### 3. Continuity of Musical Culture and SDG 11

Low-relief carvings evidence suggests a longstanding musical culture presence in the Central Javanese region. Musical instruments depicted within religious art suggest music was an integral part of daily life, deeply embedded in ritual, belief, and social practice, transmitted across generations. This enduring presence affirms music continuity as a valuable cultural form, reflecting its sustained role in shaping and preserving community cultural identity.



This study highlights the importance of cultural heritage preservation and value alignment with Sustainable Development Goal 11: Sustainable Cities and Communities (Pansuwong, Photchanachan, & Thechatakerng, 2024). Borobudur's low-relief musical instrument carvings reflect not only artistic beauty but also serve as historical and ethnomusicological evidence documenting the evolution of regional musical culture. Understanding and disseminating these cultural values contribute to cultural heritage sustainable preservation, encompassing both tangible dimension (physical artifacts conservation) and intangible dimension (cultural meanings and interpretations transmission to future generations).

## Discussions

### **1. The low-relief carvings of musical instruments reflect the role of music as a cultural mechanism connecting people with religion.**

The findings reported above support a reading of the Borobudur musical reliefs as more than decorative accompaniment to the narrative panels. Rather than restating those findings, this section situates them in relation to existing scholarship.

Two interpretive cautions follow from the evidence. First, the placement of musical imagery on the Kāmadhātū terrace supports its reading as a marker of the sensory realm, but the same imagery may equally denote musical offering (pūjā), a devotional act attested in Mahayana textual and iconographic tradition; the present corpus does not by itself adjudicate between these readings. Second, the continuity claimed between the depicted ensembles and present-day gamelan practice is plausible on morphological grounds, but establishing it requires systematic organological comparison rather than visual resemblance alone.

### **2. The Continuity of Musical Culture and Its Heritage Value**

The reliefs indicate that music was embedded in ritual, belief, and social practice in Central Java by the eighth century, and the survival of ensemble traditions in the same region invites treatment of this material as evidence of cultural continuity rather than as an isolated historical trace. The alignment with Sustainable Development Goal 11 argued here operates at the level of heritage interpretation: what warrants safeguarding is not only the physical fabric of the carvings but the interpretive knowledge that makes them legible.



### 3. Limitations of the Study

Four limitations should be noted. First, the analysis rests on a corpus of  $\llbracket N \rrbracket$  panels selected on the criteria set out in the Method section; panels that were inaccessible, heavily weathered, or outside the  $K\bar{a}madh\bar{a}tu$  sequence were not examined, so the findings do not constitute a complete inventory of musical imagery at Borobudur. Second, semiotic interpretation at the levels of connotation and myth is inherently interpretive: alternative readings of the same imagery are possible, and the analysis offered here is one reasoned reading rather than a determinate decoding. Third, the field documentation dates from 2014, and although the reliefs are physically stable, subsequent conservation records were not systematically incorporated. Fourth, no comparative fieldwork was conducted at other Southeast Asian Buddhist monuments, which would be required before regional patterns could be claimed.

### 4. Contribution to Knowledge

The contribution of the study is threefold. Theoretically, it proposes a semiotic framework for interpreting musical imagery on Buddhist monuments in which organological identification precedes and disciplines interpretation at the levels of connotation and myth. Empirically, it provides a documented and classified account of the musical instruments represented on the  $K\bar{a}madh\bar{a}tu$  terrace of Borobudur. Practically, it argues that the interpretive content of relief carving, and not only its physical fabric, constitutes heritage warranting safeguarding, which extends the tangible emphasis of monument conservation toward the intangible dimension addressed by Sustainable Development Goal 11.

### Conclusion

This study demonstrates that Borobudur's low-relief musical instrument carvings provide significant insights into 8th-9th century Javanese musical culture within the Mahayana Buddhist cosmological framework. Through Barthesian semiotic analysis, the findings reveal that these carvings function at multiple levels: denotatively representing daily life musical practices, connotatively symbolizing the sensual desire realm ( $K\bar{a}madh\bar{a}tu$ ), and contemporarily serving as cultural heritage evidence worthy of preservation.



Musical reliefs at Borobudur encapsulate music's multifaceted roles as a cultural meaning system, a social cohesion mechanism, and a religious medium of connection. Archaeological and contemporary ethnographic evidence confirms the continuity of musical traditions from ancient times to the present, demonstrating music's sustained significance for the Yogyakarta community's identity and cultural life.

Recognizing the significance of Borobudur's musical reliefs aligns with SDG 11 objectives, emphasizing the necessity of cultural heritage preservation for both tangible and intangible forms. Such preservation ensures the transmission of cultural knowledge to future generations, maintaining a living cultural heritage that remains meaningful and relevant to contemporary society. This alignment is argued at the level of heritage interpretation and value; the study did not evaluate conservation policy or measure community outcomes, and the connection to SDG 11 should therefore be read as a contribution to heritage understanding rather than as demonstrated policy impact.

Future research should explore comparative studies of musical representations across other Southeast Asian Buddhist monuments, examine the connections between contemporary gamelan traditions and ancient practices depicted in reliefs, and investigate educational approaches to integrating cultural heritage understanding into arts education curricula.

### **Acknowledgement**

The authors would like to declare that we used two artificial intelligence (AI) tools, ChatGPT and Grammarly, solely for proofreading and language editing. ChatGPT was used to refine word choice and improve the manuscript's overall readability, while Grammarly was used to correct grammar and language errors.

The authors also confirm that all content in this manuscript is entirely our own original work. No AI tools or other technologies were used to generate the actual content of the article. The ideas, analysis, and discussions presented are based on the authors' own research, supported by data from previous studies, academic articles, books, and fieldwork, all of which have been properly cited and acknowledged in accordance with academic standards.



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