



Original research

Beyond Ornamentation: Decoding Cultural Meaning in Bengal's Broto Alpona for Contemporary Design

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Abstract

Traditionally created by women undertaking religious vows, known as *Broto*, using white rice paste on earth-plastered floors, *Broto Alpona* is a ritual floor-painting tradition of Bengal. Its designs depict vows, associated deities and symbolic elements of the local environment. Although historical documentation and practitioner interviews have recorded this art form, little is known about how contemporary viewers interpret its motifs, limiting their culturally responsible adaptation in design practice. This study examines contemporary Bengali viewers' meaning-making processes, identifies culturally recognisable motifs and explores the implications for design adaptation. A two-stage qualitative study combined consultations with three practitioners and archival sources from Kolkata to select three designs—Mandal, Bhaduli Broto and Sholo Ghor—and an online, open-ended questionnaire. Of the 30 responses received, 25 were valid. The data were analysed using Peircean and Barthesian semiotics and Hall's encoding/decoding theory. Recognition declined as motifs became more abstract: 40% of respondents recognised the Ashtadal Padma (eight-petalled lotus) as a flower, and 56% identified the human figures in Bhaduli Broto, while none recognised the spiral cell in Sholo Ghor as a house. Although respondents often identified motifs' visual meanings, their ritual connotations remained largely unrecognised. The study contributes to visual semiotics and culturally responsive design by distinguishing visual recognition from cultural understanding. It interprets this gap as indicative of possible cultural-code erosion and advocates contextual motif adaptation supported by relevant cultural narratives, illustrated through a proposed sling-bag design.

Keywords: Broto Alpona; visual semiotics; intangible cultural heritage; cultural memory; heritage-based product design; Bengal folk art.

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1. Introduction

1.1 Background: Broto Alpona as a ritual visual language

The practice of drawing lines on walls and floors is among the earliest recorded visual practices in India; some researchers trace it to the Indus Valley Civilisation (Chatterji, 1948). In Bengal, line drawing became a systematised practice known as Alpona, in which drawings are made on the ground and thus fall under the category of floor painting (Chatterji, 1948; Mode et al., 1985). One type of this practice – Broto Alpona – is linked to a vow made in conjunction with fasting and worship (Biswas, 2015). Here, the vow-maker (Broti), who is typically female, promises herself a certain boon in exchange for performing the vow, during which time she creates drawings corresponding to her vows (Wadley, 1977; Kar, 2015). Such acts of creation are seen as a means of communicating with the deity, and the Brotis recite rhymes (chharas) articulating their wishes whilst creating these designs (Chatterji, 1948; Biswas, 2015). These deities may often be aspects of nature – trees, birds, animals or even water bodies (Biswas, 2015).

The drawing vocabulary varies with the vow. For example, a design depicting a fishing boat is used in Bhaduli Broto in hopes that men will return safely from the waters; a marriage chamber is depicted in Sholo Ghor Broto in search of a marital dwelling; Punyo Pukur Broto seeks the purity of village ponds (Fig. 1); and the kitchen (Ranna Ghor) feature appears in designs seeking food provision (Mode et al., 1985; Biswas, 2015). All materials used in making these drawings are biodegradable. First, the surface is smoothed, then a layer of red earth is applied to create the ground colour, and finally the drawing is made in rice paste (Chatterji, 1948; Kar, 2015). Therefore, this Broto Alpona is more than ornamentation; it is speech in action within the ritual realm.

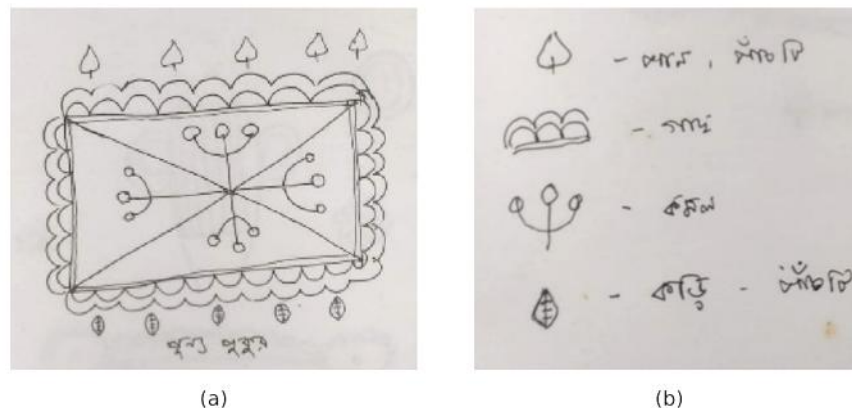


Figure 1. *Punyo Pukur Broto*, a vow undertaken by Bengali women to keep the village water source (pond) clean. (a) The Alpona design, with the pond represented as a central rectangle. (b) Key elements used in the composition, from top to bottom: betel leaf, trees, lotus, and cowrie shell. Source: Bidhan Biswas

1.2 Research gap

Documentary and ethnographic studies of Broto Alpona have yielded insights into ritual art practices and beliefs. Documentary accounts describe the art forms themselves (Chatterji, 1948), survey Indian folk arts (Mode et al., 1985), detail the ritual arts of rural India (Jayakar, 1980), and chronicle three decades of fieldwork in West Bengal, documenting the designs, rhymes, and vows (Biswas, 2015). Other ethnographic works explain the role of the broto in women's religious

devotion and aspirations (Wadley, 1977; Kar, 2015). Comparative studies analyse related floor and wall traditions, namely Aripāna in Mithila (Jha, 2010), Aipān in Uttarakhand (Tewari, 2023), rangoli patterns (Tadvalkar, n.d.), and kolam designs from Tamil Nadu (Nagarajan, 2018). Such studies conclude that these traditions are symbolic systems based on shared vocabularies within communities. Thirdly, design research shows how traditional cultural symbols may be translated into modern products (Lin, 2007; Qin et al., 2020; Xiang et al., 2025), how Indian crafts-based industries can rejuvenate using design principles (Banerjee et al., 2022), and, in our prior work, we have described the transformation of Broto folk arts from ritualistic contexts to contemporary practice (Semwal et al., 2024). Unexplored until now is the reception end of the semiotic spectrum. Documented scholarship reveals the intended meanings behind the motifs. To date, however, there is no published literature that investigates whether current-day Bengali viewers, members of the Broto Alpona community, are able to decode those meanings. Two factors motivate such investigation. Cultural evolution and globalisation influence which symbols persist in circulation and transmission. Secondly, design-based adaptation risks reducing a ritualised linguistic code to aesthetic expression when codes are left out of the translation process (Lin, 2007; Walker et al., 2018). Heritage-led design requires knowledge of which motifs retain recognisability of their cultural significance and which have lost it to guide design decision-making.

By integrating reception analysis and semiotics to offer an evidence-based guide to designing with context, this paper seeks to address this gap between the documented and the received meanings of traditional designs.

1.3 Research questions and objectives

Three research questions guide the current investigation:

- RQ1: How do contemporary Bengali audiences perceive selected traditional Broto Alpona motifs when presented without any accompanying verbal explanations?
- RQ2: What are the culturally recognizable symbolic motifs among the chosen set? Is there any correlation between levels of abstraction and recognition?
- RQ3: How can contextual knowledge enhance the process of adaptation of Broto Alpona motifs within contemporary designs? Based on these questions, the following objectives arise:
 - (i) To determine common designs and intended meanings of traditional Broto Alpona with the guidance of practitioners and archival literature;
 - (ii) To evaluate levels of recognition among the general public using an open-ended perception test;
 - (iii) To analyse findings in light of semiotic theory and cultural memory studies;
 - (iv) To develop design guidelines for adapting Broto Alpona motifs based on contextual knowledge, using a product idea as an example.

2. Ritual symbols and culture as interpretation

The Turner anthropological approach to ritual demonstrates that dominant ritual symbols are polysemic: one symbol embodies multiple layers of meaning, from the orectic pole to the ideological pole. For instance, in a Mandal Alpona, the lotus motif serves four layers of meaning

simultaneously – it represents a natural object, a divine abode, directionality and purity. Geertz's interpretive approach considers cultures as webs of significance that require interpretation through thick description. The interpretation of a motif derives from its use in ritual practice rather than solely from its appearance. Kapferer supports this position, suggesting that meaning is enacted through ritual practice rather than representation (Kapferer, 2004). Thus, when a ritual falls into disuse, the symbols used in that ritual lose their means of enaction.

2.1 Material culture, intangible heritage and cultural memory

According to the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, intangible cultural heritage comprises practices, representations and expressions, as well as knowledge systems "transmitted from generation to generation" and "constantly recreated" by communities (UNESCO, 2003). Kirshenblatt-Gimblett contends that safeguarding is itself a "metacultural" intervention that could freeze or rejuvenate the practice (Kirshenblatt-Gimblett, 2004). Smith warns that heritage is a process of constructing meanings, not an inventory of objects (Smith, 2006). Studies of material culture emphasise that objects mould the people who utilise them just as much as people shape objects (Miller, 2010). An everyday drawing on a communal floor maintains a living lexicon that a museum display cannot preserve.

Theories of cultural memory explain how such vocabularies are maintained. For Halbwachs, memories exist within a socio-cultural framework (Halbwachs, 1992); according to Assmann, there is communicative memory transmitted through interactions within three to four generations, and cultural memory encoded in text, ritual and institution (Assmann, 2011). While the motifs of daily practice are part of communicative memory, those of discontinued vows depend on archival cultural memory and are thus susceptible to oblivion. Cognitive psychological theories of schema formation and perceptual completion offer an alternative perspective: schemas guide individuals' interpretation of unfamiliar pictures, and perception completes indeterminate imagery according to the nearest schema (Bartlett, 1932; Arnheim, 1974). Contemporary research on heritage has begun to explore the potential of digital restoration of these connections for novel audiences (Buragohain et al., 2024).

2.2 Design anthropology and heritage-based product design

Design anthropology integrates ethnographic mindfulness into design as an engagement with cultural future-making beyond product creation (Gunn et al., 2013). Within cultural product design, Lin's influential framework identifies three layers of cultural aspects – outer, tangible and visible; mid, behavioural and functional; and inner, intangible and symbolic (Lin, 2007). Other frameworks adopt metaphor mapping techniques (Qin et al., 2020) or employ 'cultural carriers' to transfer meaning beyond shape into a product (Xiang et al., 2025). Some studies have examined whether generative AI can convey cultural meaning symbolically and semiotically during the concept generation of cultural products (Yin et al., 2024). Design Roots contends that culturally meaningful designs remain valuable only as long as associated practices and value systems evolve alongside (Walker et al., 2018). Studies on Indian craft industries demonstrate that design innovation based on indigenous expertise enables artisans' sustainable livelihoods (Banerjee et al., 2022), while the participatory paradigm positions communities as co-designers rather than motif providers (Sanders et al., 2008).

The marketing field draws on insights from heritage branding studies. Brand heritage encompasses an organisation's history, longevity, core principles and symbolism (Urde et al., 2007). Evaluating authenticity relies on semiotic assessment of signs of continuity and origins (Rindell et al., 2021). Yet modernising a heritage brand reduces consumer evaluations, threatening the brand's 'authentic' status (Han et al., 2021). For Broto Alpona motifs, this suggests a careful balance between relevance in application contexts and authentic representation of sources and meanings.

2.3 Abstraction and the interpretation of folk imagery

Abstract forms consist of the line, shape and pattern elements of referents, pared down to essentials. The level of abstraction determines whether the referent may be recognised (Arnheim, 1974). Indian folk motifs have always oscillated between the naturalistic representation of referents and abstraction, capturing broader concepts beyond mere resemblance to appearances (Desai, 1996; Dehejia, 2010). Indian paintings elicit diverse interpretations because much of their iconography remains foreign to many viewers (Jayakar, 1980; Dutta, 2011). Moderately abstracted motifs preserve recognisability, whereas heavily abstracted motifs require the context of codes for recognisability. This empirical investigation seeks to verify this premise for the Broto Alpona motifs.

3. Methodology

3.1 Research design

This exploratory study employed a qualitative methodology comprising two phases (see Figure 2). In Phase 1, the intended meanings of the motifs were determined through consultations with experts and archival inquiry, while in Phase 2, the interpretations of the observers/public were ascertained through open-ended questionnaires. Semiotic analysis was carried out, combining both phases, to achieve a conclusive understanding.

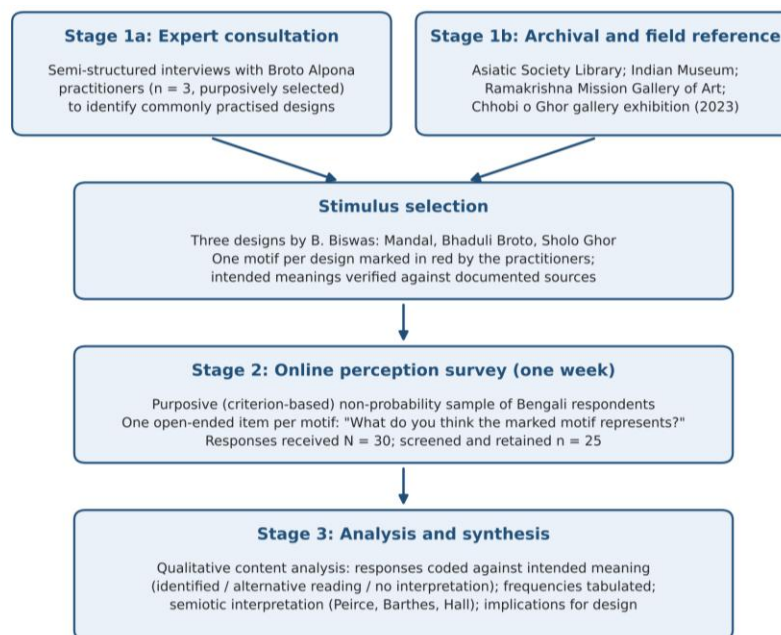


Figure 2. Study design

3.2 Stage 1: Expert consultation and stimulus selection

For the study, three practising Broto Alpona artists who regularly create Alpona ($n=3$) were purposively selected based on expert criteria. They participated in semi-structured discussions to identify common designs and motifs used in contemporary practice. These expert interviews took place from 20-23 June 2023. In addition, interviews with local experts were conducted at the field sites of Fulia, Shantiniketan, Baharampur, and Kolkata on 25 June 2023. During this phase, the author reviewed relevant archival sources available at the Asiatic Society Library, Kolkata; the Indian Museum, Kolkata; and the Ramakrishna Mission Art Gallery, as well as the Chhobi o Ghor exhibition "Alpona of Bengal" (19 May-4 June 2023).

Three Broto Alpona designs by artist and scholar Bidhan Biswas were selected as stimuli (Figure 3) based on practitioners' recommendations. For around three decades, Biswas has researched Broto Alpona, documenting designs and their socio-cultural contexts across West Bengal (Biswas, 2015). Selecting designs by the same artist controlled for variations in drawing style, so that differences in recognition levels could be attributed solely to motifs. Following consultation with practitioners, one motif was chosen from each design for testing, and the meanings of these motifs were cross-checked with secondary literature (Biswas, 2015; Kar, 2015). These motifs include the Ashtadal Padma (eight-petalled lotus) at the centre of the Mandal design, the human figures on the boat in the Bhaduli Broto design, and a spiral-patterned cell in the Sholo Ghor design, symbolising a house.

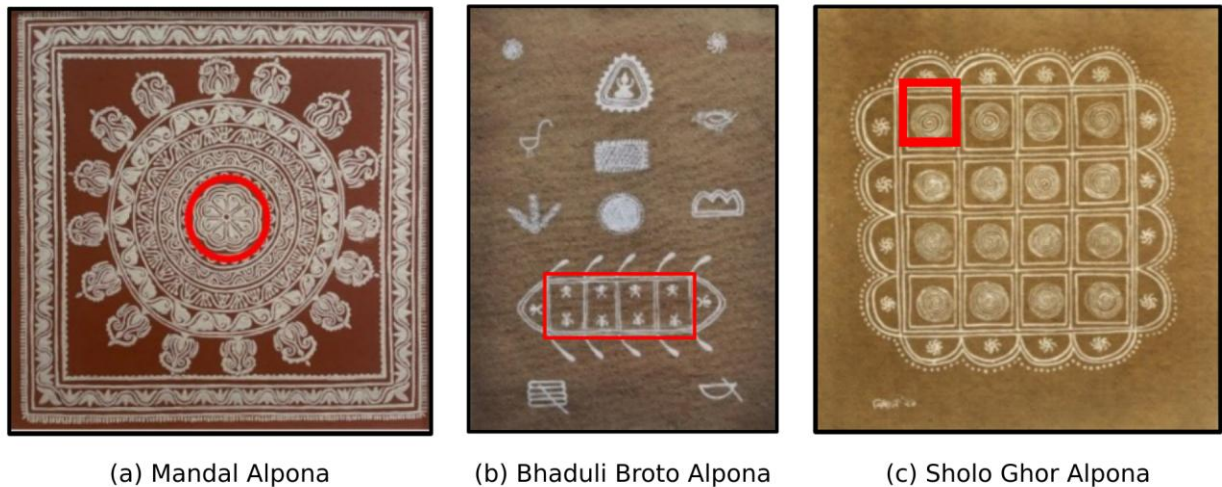


Figure 3. Stimulus designs by Bidhan Biswas, with the tested motif marked in red. (a) Mandal Alpona, an auspicious design often drawn as a gesture of welcome; marked motif: *Ashtadal Padma* (eight-petalled lotus). (b) Bhaduli Broto Alpona, drawn by women of seafaring communities for the safe return of men at sea; marked motif: human figures on the boat. (c) Sholo Ghor Alpona, drawn by unmarried girls aspiring to a happy marital home; marked motif: a spiral cell representing a home. Source: Bidhan Biswas.

3.3 Stage 2: Participants and sampling

Because the study examines perceptions of the indigenous artform among members of its indigenous culture, the target population was the Bengali people. Purposive non-probability sampling was employed. Participants needed to self-identify as Bengali and have literacy skills in Bengali, English and Hindi. The minimum age for participation was 18 years. An open online survey

via email and WhatsApp/social media messaging was conducted for seven days. Previous iterations of the paper referred to this sampling process as "purposive random sampling". Since there was no element of randomness during sampling, the method should be considered purposive non-probability sampling. Hence, the results must be interpreted and cannot be statistically generalisable to the Bengali population.

There were thirty responses in total. Five responses were excluded during screening because they failed to answer the posed question; these either made no reference to the highlighted motif or offered no interpretation of it. 5 out of 30 participants explicitly stated that they lacked any knowledge of Broto Alpona. Therefore, only twenty-five responses, all from participants above 18 years of age, representing all genders, from the city of Kolkata, West Bengal, remained for analysis.

3.4 Questionnaire design

In Stage 2, a web-based questionnaire was designed and administered to a non-random sample of Bengali participants. The questionnaire comprised three images, each featuring a design with the selected motif highlighted in red. One open-ended question ("What does the highlighted motif symbolise?") accompanied each image, allowing respondents to provide their responses without any suggestion of the correct answer. The names of the designs and their ritual purpose were concealed to ensure unaided decoding by the respondents.

3.5 Coding and analysis

Response data were analysed through qualitative content analysis using both inductive and deductive coding. First, each response was coded deductively according to the intended referent determined during Stage 1 analysis (A), any alternative interpretations (B), or lack thereof (C). Response data coded as A included those in which the respondent mentioned the referent, irrespective of its ritual name. Therefore, "flower" sufficed to code A for the Ashtadal Padma motif, while "people," "humans," and similar terms sufficed for the motif depicting humans aboard the boat, since the study focused on recognising the iconic referents. Response data coded as B were then sorted into emergent themes ("swastika," "spiral," "ornamental designs") to uncover the schemas viewers used to interpret the motifs. These data were tallied using frequency counts (see Table 1 & Fig. 4) and then analysed within the theoretical framework outlined in Section 2: the icon-symbol dichotomy according to Peirce, denotation/connotation according to Barthes, and dominant/negotiated reading according to Hall. The first and second authors undertook coding of all 75 responses independently, following a pilot on 15. Disagreements were resolved by discussion.

3.6 Validity, reliability and ethics

Triangulation enhanced credibility. Meanings attributed to the motifs were verified through practitioners' and the artist's testimony and published materials. Thus, correct identification was based on multiple authorities. Consistency in stimuli was achieved by selecting motifs solely from the artist's collection and asking the same question for each stimulus. Dependability was assured through the use of a clear codebook and by presenting competing interpretations alongside the frequency counts. Given the limited, purposeful sampling method used, the results are transferable, not generalisable. Nevertheless, they suggest trends worthy of investigation through large-scale and stratified samples. Anonymity and voluntarism governed participant recruitment.

4. Results

Table 1 and Figure 4 summarize recognition of the three motifs. Recognition was partial for the Ashtadal Padma (10 of 25 respondents; 40%), highest for the human figures on the Bhaduli boat (14 of 25; 56%) and absent for the Sholo Ghor home motif (0 of 25).

Table 1. Respondents' recognition of the selected Broto Alpona motifs (n = 25).

Motif (design)	Intended meaning	Identified (n/25)	%	Common interpretations	alternative
<i>Ashtadal Padma</i> (Mandal)	Eight-petalled lotus; purity; centre of the sun-mandala	10	40	Flower	
Human figures on boat (Bhaduli Broto)	Passengers and seafarers whose safe return is sought	14	56	Swastika; abstract figure	
Spiral cell (Sholo Ghor)	Home (one of sixteen future marital homes); place of the <i>sora</i>	0	0	Spiral; decorative pattern	

Note. "Identified" = response named the intended referent at least at a basic level (e.g., "flower" for the lotus; "people" for the human figures). Percentages are of the 25 retained responses.

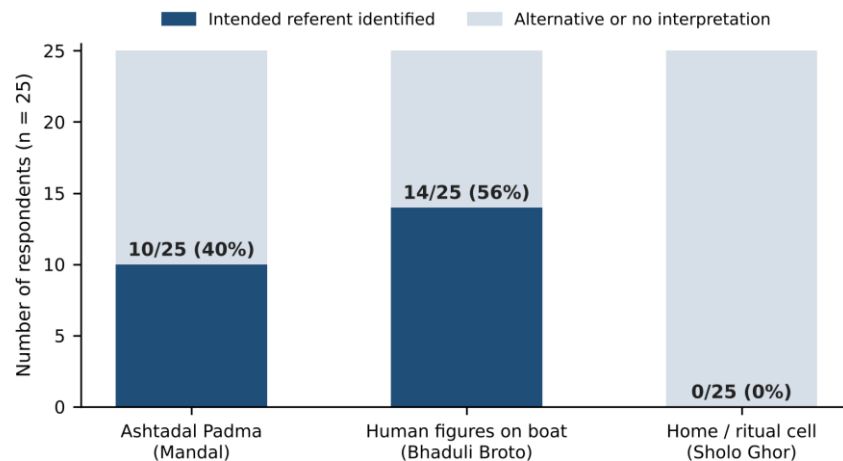


Figure 4. Number of respondents (n = 25) who identified the intended referent of each marked motif. Recognition is shown against the share of alternative or absent interpretations.

4.1 Mandal Alpona: the Ashtadal Padma

Centrifugal Mandal Alpona designs are drawn in the middle of courtyards to attract divine blessings on auspicious occasions (Kar, 2015). The process begins with the drawing of the eight-petalled Ashtadal Padma in the centre, which is referred to as Kendra Kamal (Figure 5). Around this mandala is the circular Lata Mandan band decorated with creeping plant vines. Its dimensions may vary according to personal preference. Motifs within this band, which include fruits,

vegetables, flowers, and lotuses, derive from everyday elements within the realm of experience of the vow-maker (Biswas, 2015), thus reflecting her uniqueness. Ornamental designs along the perimeter are called kalas. Mandal Alpona as a unit symbolises the sun deity.

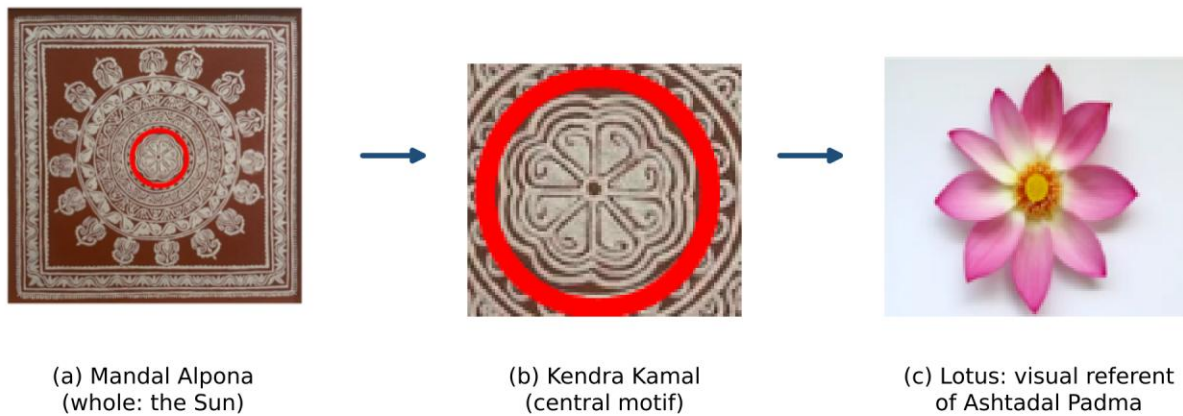


Figure 5. Structure of the Mandal Alpona. (a) The complete Mandal, which as a whole represents the Sun. (b) The *Kendra Kamal*, the central position occupied by the *Ashtadal Padma*. (c) The lotus, the visual referent of the central motif. Source: (a, b) Bidhan Biswas; (c) Wikipedia

Layered Meanings: Ashtadal Padma: The Ashtadal Padma holds multiple levels of meaning. First, the design represents eight directions: north (uttara), east (purva), south (daksina) and west (paschima), and northeast (ishanya), southeast (agneya), northwest (vayavya) and southwest (nairutya), consecrated in religious rituals to denote purity and sanctity (Figure 6) (Jha, 2010). Next, in yogic practices, the eight-petal lotus denotes the withdrawal of the mind's attention from bodily concerns towards the realms of light and sound, in pursuit of spiritual enlightenment (Jha, 2010). The popularisation of the lotus motif in Indian art came with the spread of Buddhism (Tewari, 2023; Ahmad et al., 2018). Finally, it denotes prosperity in festive floor decorations across India (Tadvalkar, n.d.).

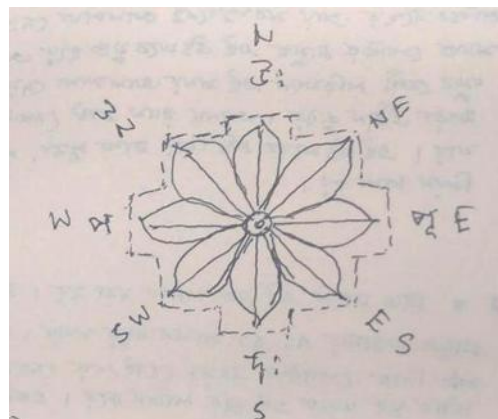


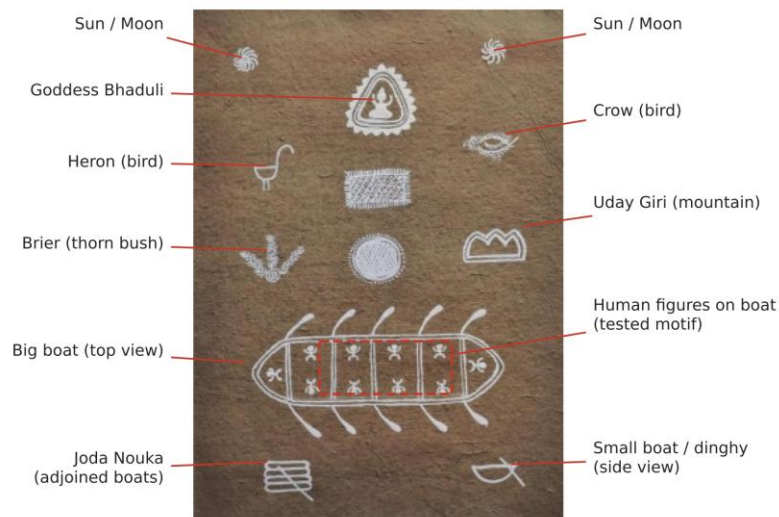
Figure 6. Concept sketch of the *Ashtadal Kamal*, showing the eight petals aligned with the eight directions, as it can be drawn on the floor by the traditional method. Source: Bidhan Biswas.

Ten respondents recognised the motif as a flower; however, they did not recover its deeper symbolic significance. They read the motif as an icon of the flower but failed to recognise its role as the focal point of the mandala of the sun and direction. The motif's moderate level of

abstraction ensured its recognisable visual representation. Petals emerged around a central point, an element commonly perceived to belong to flowers since childhood. Lata Mandan's surrounding motifs of flowers helped reinforce this interpretation via Barthesian relay (Barthes, 1977).

4.2 Bhaduli Broto Alpona: human figures on the boat

Bhaduli Broto is practised in September by families associated with marine navigation or fishing, and the design draws on the historical maritime expeditions in Bengal (Figure 7) (Kar, 2015). The design features images of various water vessels, such as the Joda Nouka (double boats used for cargo) and the Chhoto Nouka (small boat that ferries people from distant shores to the larger Joda Nouka) (Biswas, 2015). In the vow-making process, the vow-maker invokes safety for navigating water vessels and seeks divine blessings to protect the journeyers' eyesight from obstruction while traversing 'Uday Giri' (sunrise mountain). They also pray for protection from thorny plants during their journey back home (Kar, 2015). With decreasing dependence on water vessels for travel, there has been a corresponding reduction in the practice of the broto.



(a)



(b) Boat, top view



(c) Small boat, side view

Figure 7. Bhaduli Broto Alpona by Bidhan Biswas. (a) The design with its elements labelled; the tested motif (human figures on the boat) is outlined. (b) The large boat, depicted from above. (c) The small boat, depicted from the side. The design combines viewpoints, showing the large boat from above and the small boat from the side. Source: (a) Bidhan Biswas; (b, c) Wikipedia.

Among all motifs examined, the human figures achieved the highest level of recognition (14 out of 25 respondents). Two factors can explain why the figures performed better among contemporary viewers than the other two tested motifs. Firstly, the figures share the greatest degree of iconic likeness to their reference object compared with the other two motifs tested. Human limbs and heads are represented schematically. Secondly, contextual cues are provided by boats – the presence of a boat prompts viewers to assume passengers on board. Respondents who could not recognise the figures tended to see a swastika icon or an abstract shape instead. Morphologically, the schematic representation of human bodies with bent limbs in Broto Alpona bears a strong resemblance to the swastika symbol, which dominates today's visual environment (Bartlett, 1932; Arnheim, 1974).

4.3 Sholo Ghor Alpona: the spiral as home

The Sholo Ghor Broto features sixteen squares symbolising the sixteen houses of sixteen unmarried Brotis for whom they are praying for marital happiness. The square symbolises the house, while the spiral inside represents a *sora*—a clay dish used to hold vermilion, bangles, and bindi, amongst other ritualistic materials [Figure 8].

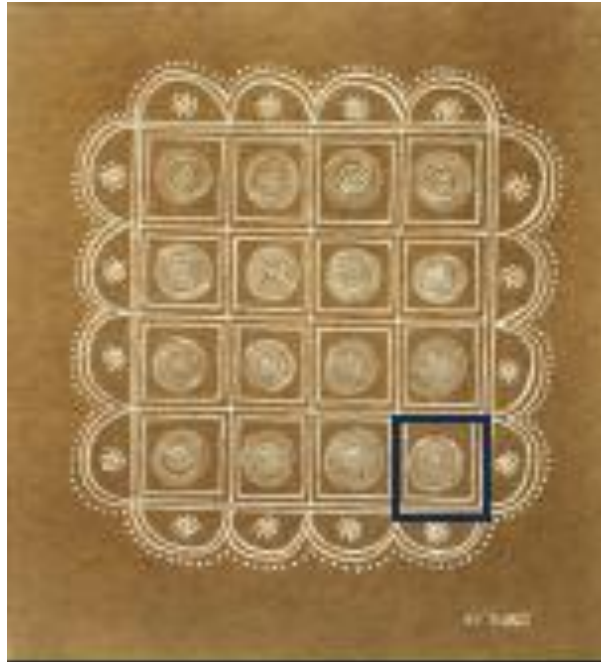
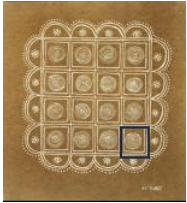


Figure 8. Sholo Ghor Alpona by Bidhan Biswas. The marked cell is one of the sixteen "homes"; its spiral marks the position of the *sora* (earthen plate).

The findings revealed that none of the 25 participants recognised the motif as representing a house. Instead, it elicited descriptions such as spirals or patterns. In fact, the motif bears no resemblance to any kind of domicile – neither does the square nor the spiral – and thus its interpretation hinges on familiarity with the ritual practice in which it appears. According to Peirce's classification of signs, the motif functions as a symbol rather than an icon of a home, perhaps also as an index of the *sora*.

Table 2. Semiotic analysis of the tested motifs: intended meaning, visual referent, dominant sign type and recognition.

No.	Motif	Intended meaning	symbolic	Visual referent	Dominant sign type (Peirce)	Recognition
1		<i>Ashtadal Padma</i> : purity and enlightenment; marks the eight directions. The whole Mandal represents the Sun.			Icon (form) carrying symbolic meaning	Partial (40%); denotative level only
2		Human figures on the boat: passengers and seafarers whose safe return is sought.			Icon (schematic human figure, morphologically close to the swastika)	Highest (56%); aided by boat as contextual cue
3		Home: one of sixteen future marital homes; the spiral marks the place of the <i>sora</i> .			Symbol (with indexical function); no real-world resemblance	None (0%)

Source. Motif images: Bidhan Biswas. Referent images: Wikipedia.

5. Discussion

5.1 Why participants misidentified motifs

These findings suggest a gradient of recognition. Recipients successfully recovered the denotative layer of motifs when resemblance facilitated the task, but supplied substitutes when resemblance was insufficient (Table 2). Errors occurred systematically, not at random. For example, recipients interpreted the human figures as Swastikas and the house-shaped cells as spirals. They relied on existing codes to make sense of these forms, a phenomenon Eco defines as aberrant decoding (Eco, 1976). From Hall's perspective, recipients generated negotiated interpretations that acknowledged the form while providing alternative meanings based on current visual languages across India (Hall, 1980). The compositional context supported recognition. In other words, the floral border framing the lotus and the boat containing the figures enhanced recognition, confirming that internal relays can partially substitute for absent verbal codes (Barthes, 1977).

5.2 How cultural memory shapes recognition

Only motifs that retain circulation within communicative memory persist (Assmann, 2011). The lotus remains prevalent across Indian celebratory and religious iconography, and the depiction of the human body functions as an archetypal schema. By comparison, the home motif within Sholo

Ghor refers to a vow rarely practised today, with its code surviving only in cultural memory, preserved in archives, recorded in Biswas' work, and known among some practitioners. When a practice ceases, the social contexts that support its memory dissolve, rendering its symbolism intelligible only to specialists (Halbwachs, 1992). The declining practice of Bhaduli Broto, driven by reduced reliance on river navigation, highlights the role of livelihood in providing contexts for acquiring motifs.

5.3 Semiotic degradation over time

Findings suggest a process that may be termed semiotic degradation, in which connotative layers erode, leaving only the denotative form. Turner's multivocality of ritual symbols (Turner, 1967) becomes a degradation to sensory poles; the lotus retains its denotation as a flower, but not as the Sun's centre and compass of eight directions, and the spiral shape retains its denotation as a design, but does not denote as a home. However, it would be inaccurate to conclude that the motifs fail; semiotic degradation demonstrates the disconnection between the image and the performance of recitation rituals, communities that Geertz and Kapferer assert constitute meaning-making (Geertz, 1973; Kapferer, 2004). From the perspective of cultural evolutionary theories, such drift should occur if the transmission of practices is lost, even as their forms persist in new environments (Creanza et al., 2017). Festive decorations that utilise motifs of the popular Alpona tradition maintain the Broto Alpona form without the vow-specific semantic associations (Mukherjee, 2024, January 9).

5.4 Implications for heritage transmission

If intangible heritage conservation is understood as sustaining ongoing creation within the community (UNESCO, 2003), conserving the design itself is inadequate; it is necessary to conserve the meaning-codes behind those designs as well. This paper shows that different designs require varying degrees of context for decoding. While high-iconicity designs can serve as starting points, more familiar designs, such as the Sholo Ghor House, will need narrative scaffolding, either in the form of captions or poems recited alongside the motifs, or experiential activities. Interventions in heritage practice must therefore resist freezing the tradition (Kirshenblatt-Gimblett, 2004; Smith, 2006); restoring the conditions for decoding, rather than a particular interpretation, is crucial.

5.5 Consequences for design adaptation

This gradient can serve as a basis for successful adaptation. For instance, iconic motifs such as the eight-petal lotus or human figures can retain recognisability when adapted into products; however, conventional motifs, such as those associated with the Sholo Ghor home and the ritual cells, will not convey any significance unless explained alongside the designs. Otherwise, there is the risk of semiotic degradation, to the point of becoming ethnic ornamentation (Lin, 2007; Walker et al., 2018).

6. Design Application: From Motif to Meaningful Product

6.1 A context-led design approach

In accordance with Lin's Three Levels Theory (Lin, 2007) and principles of Human Centred Design (International Organization for Standardization, 2019), the findings propose a context-led approach to motif-based product design in four stages:

- (i) Decode. Through consultation with practitioners similar to Stage 1 of this study, identify the vow, meaning and deity associated with the motif, including any related rhymes. Categorise the motif based on Table 2 along the icon-symbol continuum.
- (ii) Select and transform. Identify at what level meaning will transfer to the product—outer appearance, visual motif (iconic); middle use/usage/function, auspiciousness/protection (symbolic); or innermost abstract significance (wishes for safety/home/prosperity etc.). Moderation of abstraction is recommended when recognisability is a priority.
- (iii) Anchor. Use traditional motifs alongside narrative anchoring strategies, including swing tags, labels embroidered in Bengali and English language, QR linkages to stories, and package wrapping which repeats any associated rhymes, thus allowing self-encoded products (Barthes, 1977).
- (iv) Co-create and evaluate. Collaborate with artisans and practitioners as partners in conceptualisation and design processes (Gunn et al., 2013; Sanders et al., 2008). Test concepts amongst users using a modified version of the methodology used here in order to evaluate user perceptions prior to manufacture.

6.2 Illustrative concept: the Lakshmi Asan sling bag

Handbags have been described as 'portable art pieces' that signal taste and sensitivity towards art (Pakanen et al., 2016) and can be extended through co-design. As daily-use artefacts that travel in and out of Bengal, they provide a means to incorporate Alpona patterns into everyday experience. This section introduces a handbag concept inspired by the Broto Alpona Lakshmi Asan (see Fig. 10b). The front face features motifs from the Lakshmi Asan, including the Aadi Mata and Aadi Pita (first human woman and man), the earth spiral, the owl, floral designs, the healing plant (Aushadi gach), and the goddess footsteps. The back face extends the vine border pattern. In line with the findings, iconic motifs such as humans, the owl, and the goddess footsteps are retained in abstracted form without losing recognisability, whereas the symbolic representation – the earth spiral pattern and the entire arrangement of the seat for the goddess – is explained through a narration of the vow for prosperity included on a label attached to the bag.

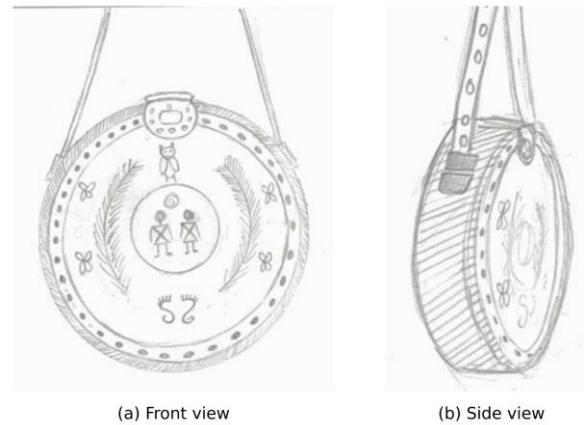


Figure 9. Sling-bag concept based on the *Lakshmi Asan* of Broto Alpona. (a) Front view, showing the Lakshmi Asan motif composition. (b) Side view, showing the creeper (*lata*) used in the Lakshmi Asan. Source: concept sketches by the authors.

6.3 Heritage branding and authenticity

Literature on heritage branding has established that any heritage product derives its value from the narrative that surrounds it. Consumers decode authenticity from elements of provenance and longevity (Rindell et al., 2021), while heritage brands capitalise on historical significance and symbolism (Urde et al., 2007). According to Han et al., however, altering a heritage product may lead consumers to view it as less appealing because the alteration represents a betrayal of the heritage value (Han et al., 2021). In applying this learning to Broto Alpona products, the implication is that heritage attributes should be clearly attributed, while the motifs should retain integrity while allowing experimentation with medium, materials and application.

6.4 Craft innovation and sustainable design

Material ethics in Broto Alpona provides an effective model of sustainable translation. Both materials used in creating Broto Alpona designs—rice paste and earth—are biodegradable and local, being renewed repeatedly at every ritual performance. In translating the motifs into products, the use of organic fibres and dyes and handcrafting techniques like kantha embroidery and hand-block printing could ensure sustainability. Models in which design enterprises work with artisans, allowing artisans to benefit economically from their craftsmanship, have been demonstrated in India; these models provide scope for livelihood creation (Banerjee et al., 2022). Narrative and attachment are key factors that ensure retention and reuse rather than disposal of heritage products (Chapman, 2015).

6.5 Broto Alpona and decorative Alpona as distinct design sources

Modern decorative Alpona of Santiniketan has evolved into a popular household practice throughout West Bengal irrespective of class (50). It draws extensively from Broto Alpona but serves an ornamental purpose alone. Syncretization with other types of flooring designs has resulted in modifications to both structure and context (Figure 10a). On the other hand, Broto Lakshmi Asan is an instance of contextual composition, where all components serve a purpose within the vow ritual (Figure 10b). While the two styles share a relationship, they must be

approached differently in terms of sourcing designs. The former provides a repertoire of ornamental elements, whereas the latter provides a narrative repertoire.

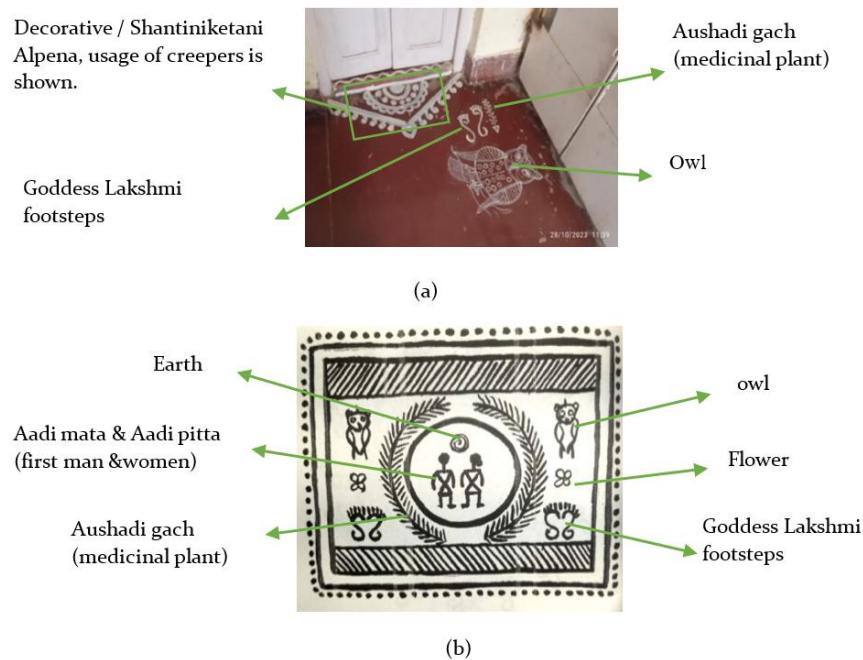


Figure 10. Decorative and ritual Alpona compared. (a) Syncretized decorative (Santiniketan-style) Alpona drawn at a doorway for Lakshmi Puja; creepers dominate and ritual elements are dispersed. Photograph dated 28 October 2023 by Shreejit Guha (b) *Lakshmi Asan* as practised in Broto Alpona, in which each element carries a defined role.

7. Conclusion

In conclusion, the study explores the interpretative strategies of contemporary Bengali viewers in relation to three Broto Alpona motifs and examines implications for design and cultural sustainability. The main observations were that recognition decreased with abstraction: human figures on the Bhaduli boat were partially recognised (56%), Ashtadal Padma partially recognised (40%), and no recognition occurred in the case of Sholo Ghor motifs. Recognition occurred only at the denotative layer: respondents recognised the icons of the flower and human beings but could not see the sun, the eight directions or the marital dwelling house. Misinterpretations occurred systematically based on common schemata of the swastika and decorative spiral. This pattern indicates loss of cultural codes used for interpretation, rather than errors.

Theory-wise, the study adds a case study for examining semiotic degradation of cultural signs within a living folk practice. The icon-symbol continuum by Charles Sanders Peirce, the connotation-denotation distinction by Roland Barthes, as well as the communicative and cultural memory distinction by Jan Assmann, combine to explain why certain ritual meanings endure despite waning performance practice. This study moves documentary scholarship on Alpona towards audience studies. Design-wise, a context-led strategy for adaptation is proposed (decode, select and transform motifs, anchor motifs within contexts, co-create products and evaluate). This paper claims that for successful adaptation motifs need to be accompanied by their narratives,

illustrated through the example of sling-bag design. Cultural sustainability-wise, it appears that preservation of Broto Alpona depends upon dissemination of the cultural codes used for decoding motifs, i.e., the rhymes, vows and contexts. The dissemination could occur via educational interventions, museum exhibitions, storytelling projects, as well as products explaining the motifs' meaning.

Limitations include a small and non-randomly chosen sample size (n=25), testing of only three motifs painted by one artist, the focus of the questionnaire being on identification rather than on emotional/aesthetic experience, and limited choice of motifs. Possible ways forward are conducting surveys among large stratified samples across different age groups and ritual involvement levels to observe cross-generation recognition patterns; inclusion of greater number of motifs and artists in analysis; testing responses both in isolated contexts and anchored to ritualistic practices; designing and user testing prototypes.

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References

- Ahmad, A. B., et al. (2018). Symbolism of Buddhist architecture in Indian building and structure. *International Journal of Innovative Science and Research Technology*, 3(9).
- Arnheim, R. (1974). *Art and visual perception: A psychology of the creative eye* (New version). University of California Press.
- Assmann, J. (2011). *Cultural memory and early civilization: Writing, remembrance, and political imagination*. Cambridge University Press.
- Banerjee, A., & Mazarella, F. (2022). Designing innovative craft enterprises in India: A framework for change makers. *She Ji: The Journal of Design, Economics, and Innovation*, 8(2), 193–216. <https://doi.org/10.1016/j.sheji.2022.04.001>
- Barthes, R. (1977). *Image, music, text* (S. Heath, Trans.). Fontana.
- Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology*. Cambridge University Press.
- Biswas, B. (2015). *Alponar angane* [In the courtyard of Alpona]. CAMP.
- Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE.
- Buragohain, D., Meng, Y., Deng, C., Li, Q., & Chaudhary, S. (2024). Digitalizing cultural heritage through metaverse applications: Challenges, opportunities, and strategies. *Heritage Science*, 12. <https://doi.org/10.1186/s40494-024-01403-1>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652–661. <https://doi.org/10.1177/1744987120927206>
- Chandler, D. (2022). *Semiotics: The basics* (4th ed.). Routledge.

- Chapman, J. (2015). *Emotionally durable design: Objects, experiences and empathy* (2nd ed.). Routledge.
- Chatterji, T. (1948). *Alpona: Ritual decoration in Bengal* (with notes by T. C. Das). Orient Longmans.
- Creanza, N., Kolodny, O., & Feldman, M. W. (2017). Cultural evolutionary theory: How culture evolves and why it matters. *Proceedings of the National Academy of Sciences*, 114(30), 7782–7789. <https://doi.org/10.1073/pnas.1620732114>
- Dehejia, H. V. (2010). *Akriti to sanskriti: The journey of Indian forms*. Niyogi Books.
- Desai, M. (1996). *To the roots: Designer journey*.
- Dutta, S. (2011). The mystery of Indian painting. *Chitrolekha International Magazine on Art and Design*, 1(1), 14–27.
- Eco, U. (1976). *A theory of semiotics*. Indiana University Press.
- Geertz, C. (1973). *The interpretation of cultures*. Basic Books.
- Gunn, W., Otto, T., & Smith, R. C. (Eds.). (2013). *Design anthropology: Theory and practice*. Bloomsbury.
- Halbwachs, M. (1992). *On collective memory* (L. A. Coser, Ed. & Trans.). University of Chicago Press.
- Hall, S. (1980). Encoding/decoding. In S. Hall, D. Hobson, A. Lowe, & P. Willis (Eds.), *Culture, media, language* (pp. 128–138). Hutchinson.
- Han, M., Newman, G. E., Smith, R. K., & Dhar, R. (2021). The curse of the original: How and when heritage branding reduces consumer evaluations of enhanced products. *Journal of Consumer Research*, 48(4), 709–730. <https://doi.org/10.1093/jcr/ucab028>
- International Organization for Standardization. (2019). *Ergonomics of human-system interaction—Part 210: Human-centred design for interactive systems* (ISO Standard No. 9241-210:2019).
- Jayakar, P. (1980). *The earthen drum: An introduction to the ritual arts of rural India*. National Museum.
- Jha, S. K. (2010). *Search for symbolic significance of Aripana* [Unpublished thesis]. Tribhuvan University, Kirtipur, Kathmandu, Nepal.
- Kapferer, B. (2004). Ritual dynamics and virtual practice: Beyond representation and meaning. *Social Analysis*, 48(2), 33–54.
- Kar, R. (2015). Mirroring aspirations: Alponas in the Broto ritual of Bengal. *Remarking*, 2(5), 72–75.
- Kirshenblatt-Gimblett, B. (2004). Intangible heritage as metacultural production. *Museum International*, 56(1–2), 52–65. <https://doi.org/10.1111/j.1350-0775.2004.00458.x>
- Kress, G., & van Leeuwen, T. (2021). *Reading images: The grammar of visual design* (3rd ed.). Routledge.
- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). SAGE.
- Lin, R.-T. (2007). Transforming Taiwan aboriginal cultures into cultural product design: A case study of a cross-cultural product design model. *International Journal of Design*, 1(2), 45–53.
- Miller, D. (2010). *Stuff*. Polity.
- Mode, H., & Chandra, S. (1985). *Indian folk art*. Taraporevala.
- Mukherjee, S. (2024, January 9). Evolution of alpona in Santiniketan was a venture into a secular aesthetic world. *Get Bengal*. <https://www.getbengal.com/details/Evolution-of-alpona-in-Santiniketan-was-a-venture-into-a-secular-aesthetic-world>

- Nagarajan, V. (2018). *Feeding a thousand souls: Women, ritual, and ecology in India—An exploration of the kolam*. Oxford University Press.
- Pakanen, M., Lappalainen, T., Roinesalo, P., & Häkkinen, J. (2016). Exploring smart handbag concepts through co-design. In *Proceedings of the 15th International Conference on Mobile and Ubiquitous Multimedia* (pp. 37–48). ACM.
- Peirce, C. S. (1931–1958). *Collected papers of Charles Sanders Peirce* (Vols. 1–8; C. Hartshorne, P. Weiss, & A. W. Burks, Eds.). Harvard University Press.
- Qin, Z., & Ng, S. (2020). Culture as inspiration: A metaphorical framework for designing products with traditional cultural properties (TCPs). *Sustainability*, 12(17), Article 7171. <https://doi.org/10.3390/su12177171>
- Rindell, A., & Pinto Santos, F. (2021). What makes a corporate heritage brand authentic for consumers? A semiotic approach. *Journal of Brand Management*, 28, 545–558. <https://doi.org/10.1057/s41262-021-00243-9>
- Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign*, 4(1), 5–18. <https://doi.org/10.1080/15710880701875068>
- Semwal, V., Guha, S., & Chakrabarti, D. (2024). From tradition to transformation: Exploring Broto folk art of Bengal. *Chitrolekha Journal on Art and Design*, 8(1).
- Smith, L. (2006). *Uses of heritage*. Routledge.
- Tadvalkar, N. (n.d.). A language of symbols: Rangoli art of India. In *Traditional knowledge and traditional cultural expressions* (pp. 173–186).
- Tewari, D. K. (2023). *Aipan: Intangible cultural heritage of Uttarakhand*. Blue Rose.
- Turner, V. (1967). *The forest of symbols: Aspects of Ndembu ritual*. Cornell University Press.
- UNESCO. (2003). *Convention for the safeguarding of the intangible cultural heritage*. <https://ich.unesco.org/en/convention>
- Urde, M., Greyser, S. A., & Balmer, J. M. T. (2007). Corporate brands with a heritage. *Journal of Brand Management*, 15(1), 4–19. <https://doi.org/10.1057/palgrave.bm.2550106>
- Wadley, S. S. (1977). Women and the Hindu tradition. *Signs: Journal of Women in Culture and Society*, 3(1), 113–125. <https://doi.org/10.1086/493445>
- Wadley, S. S. (2000). *From sacred cow dung to cow 'shit': Globalization and local religious practices in rural North India*.
- Walker, S., Evans, M., Cassidy, T., Jung, J., & Twigger Holroyd, A. (Eds.). (2018). *Design roots: Culturally significant designs, products and practices*. Bloomsbury.
- Xiang, Z. R., Li, M., Wu, Y. M., Xu, X. F., Zhang, F., & Zhao, X. (2025). Cultural product design: An approach for identifying cultural carriers, transforming cultural elements and applying cultural features. *Design Science*, 11, Article e39. <https://doi.org/10.1017/dsj.2025.10031>
- Yin, Y., Ding, S., Zhang, X., Wang, C., Li, X., Cai, R., Shou, Y., Qiu, Y., & Chai, C. (2024). Cultural product design concept generation with symbolic semantic information expression using GPT. In C. Gray, E. Ciliotta Chehade, P. Hekkert, L. Forlano, P. Ciuccarelli, & P. Lloyd (Eds.), *DRS2024: Boston*. Design Research Society. <https://doi.org/10.21606/drs.2024.508>

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