

# Evolutionary Perspectives on Art Origins

EP theories differentiate between visual arts' origins in spatial cognition and narrative arts' roots in language processing and temporal sequencing.

## Abstract

Ten studies on the evolutionary origins of art suggest that both visual and narrative forms share ancient roots yet follow distinct cognitive and developmental paths. Four studies concentrating on visual art, three on narrative art, and three on both reveal that many authors use cognitive adaptation theory—with several supplementing their models with social communication and neurological frameworks—to explain art's biological and social functions.

Visual art is portrayed as emerging from adaptations in the visual cortex and spatial cognition, with evidence derived from Paleolithic artifacts and neurological models (e.g., Hodgson, Morriss-Kay). In contrast, narrative art is linked to the evolution of language, event comprehension, and temporal sequencing as underscored by studies from Boyd (2009, 2017) and others. Both art forms are credited with fostering social cohesion, information sharing, and emotional regulation, yet they diverge sharply in their reliance on language versus spatial processing.

## Paper search

Using your research question "How do EP theories about the origins of arts differ for visual arts vs narrative arts?", we searched across over 126 million academic papers from the Semantic Scholar corpus. We retrieved the 50 papers most relevant to the query.

## Screening

We screened in papers that met these criteria:

- **Evolutionary Framework:** Does the study examine art origins from an evolutionary psychological perspective (either theoretical or empirical)?
- **Art Forms:** Does the study focus on visual arts (painting, sculpture, drawing) and/or narrative arts (storytelling, literature, oral traditions)?
- **Temporal Scope:** Does the study address evolutionary or historical origins rather than focusing solely on contemporary art movements?
- **Theoretical Framework:** Does the study include evolutionary implications beyond purely social/cultural analysis?
- **Research Focus:** Does the study extend beyond purely technical aspects, art therapy, or educational applications?
- **Art Form Scope:** Does the study focus on visual and/or narrative arts rather than exclusively on music or dance?
- **Study Type:** Is the study one of the following: original research, systematic review, meta-analysis, or cross-cultural analysis?
- **Research Implications:** Does the study contribute to understanding the evolutionary origins or universal patterns of human artistic behavior?

We considered all screening questions together and made a holistic judgement about whether to screen in each paper.

## Data extraction

We asked a large language model to extract each data column below from each paper. We gave the model the extraction instructions shown below for each column.

- **Type of Theoretical Approach to Arts Origins:**

Identify the specific evolutionary psychological (EP) theory proposed about the origins of arts. Look in the introduction, theoretical framework, or discussion sections.

Categorize the theory as:

- Neurological/Brain-based theory
- Cognitive adaptation theory
- Social communication theory
- Other (specify)

If multiple theories are discussed, list all and indicate which is primary. If no clear EP theory is presented, note "No explicit EP theory identified".

Extract verbatim quotes that explain the core theoretical mechanism for arts origins.

- **Arts Domain Specificity:**

Determine whether the theory addresses:

- Visual arts specifically
- Narrative/verbal arts specifically
- Both visual and narrative arts
- Neither (general arts theory)

Extract specific passages that discuss differences or similarities between visual and narrative arts origins. Note any explicit comparisons made between these domains.

- **Proposed Evolutionary Mechanism for Arts:**

Identify the specific evolutionary mechanism proposed for arts emergence:

- Natural selection
- Sexual selection
- Cultural evolution
- Cognitive by-product
- Combination of mechanisms

Extract direct quotes explaining the proposed evolutionary mechanism. Note any specific adaptive advantages suggested for arts production or consumption.

- **Cognitive/Neurological Foundations:**

Identify specific cognitive or neurological capabilities cited as foundational to arts origins:

- Brain region involvement

- Cognitive capacities (e.g., imagination, memory)
- Perceptual mechanisms

Extract precise descriptions of how these cognitive/neurological features contribute to arts emergence. Note any distinctions made between visual and narrative arts cognitive foundations.

- **Historical Evidence for Theory:**

Identify types of historical/archaeological evidence used to support the theory:

- Paleolithic artifacts
- Cave paintings
- Early narrative/storytelling evidence
- Comparative evidence from other species

Extract specific examples and dates mentioned. Note the strength and specificity of historical evidence provided.

## Results

### Characteristics of Included Studies

Study	Study Focus (Visual/Narrative/Both)	Theoretical Framework	Key Evolutionary Mechanisms	Primary Conclusions	Full text retrieved
Boyd, 2009	Narrative	Cognitive adaptation theory	Natural selection, Cognitive by-product	Art is an adaptation linked to cognitive play, enhancing social cognition and cooperation	Yes
Boyd, 2017	Narrative	Social communication theory, Cognitive adaptation theory	Cultural evolution	Narrative evolved from mimesis to language, enabling sharing of experiences beyond direct observation	Yes

Study	Study Focus (Visual/Narrative/Both)	Theoretical Framework	Key Evolutionary Mechanisms	Primary Conclusions	Full text retrieved
Davis and Dissanayake, 1990	Both	Cognitive adaptation theory	Natural selection	Art is a biological necessity, making socially important activities memorable and pleasurable	No
Hodgson, 2006	Visual	Neurological/Brain based theory	Cognitive by-product	Visual art emerges from brain's visual processing and motor pathways	No
Morriss-Kay, 2010	Visual	Neurological/Brain based theory, Cognitive adaptation theory	Natural selection	Art creation linked to cognitive evolution and survival advantages in tool-making and hunting	Yes
Mühlenbeck and Jacobsen, 2020	Visual	Cognitive adaptation theory, Social communication theory	Sexual selection, Cultural evolution, Cognitive by-product	Visual symbols evolved as social signals and extended phenotypes	Yes
Saito, 2021	Both	Cognitive adaptation theory	Cultural evolution, Cognitive by-product	Art linked to cognitive evolution, language acquisition, and pareidolia	Yes
Scalise Sugiyama, 2001	Narrative	Cognitive adaptation theory	Natural selection	Narrative is a product of the mind shaped by natural selection	No

Study	Study Focus (Visual/Narrative/Both)	Theoretical Framework	Key Evolutionary Mechanisms	Primary Conclusions	Full text retrieved
Straffon, 2014	Visual	Social communication theory	Cultural evolution	Visual art functions as a communication signal in human cooperation strategies	No
Zaidel et al., 2013	Both	No mention found	Combination of mechanisms	Art and aesthetics evolved through gradual, mosaic coevolutionary processes	No

We found the following patterns across the studies:

- Study Focus :
  - 4 studies focusing on visual art
  - 3 studies on narrative
  - 3 studies on both visual and narrative art forms
- Theoretical Framework :
  - Cognitive adaptation theory was the most common framework, used in 7 studies
  - Social communication theory was used in 3 studies
  - Neurological/Brain-based theory was used in 2 studies
  - No mention of a theoretical framework was found for 1 study
- Key Evolutionary Mechanisms :
  - Natural selection, cognitive by-product, and cultural evolution were each mentioned in 4 studies
  - Sexual selection was mentioned in 1 study
  - 1 study referred to a combination of mechanisms without specifying them

9 out of 10 studies employed multiple theoretical frameworks or evolutionary mechanisms in their explanations of art's origins and functions.

## Thematic Analysis

### Evolutionary Origins and Timing

Theme	Visual Arts Evidence	Narrative Arts Evidence	Theoretical Convergence/Divergence
Earliest Evidence	Paleolithic artifacts and cave paintings, over 100,000 years ago	Pre-dates writing, agriculture, and permanent settlement	Convergence: Both forms have ancient origins
Cognitive Prerequisites	Visual cortex and visuo-spatial brain areas development	Event comprehension, memory, imagination	Divergence: Different cognitive foundations emphasized
Role of Language	Potential influence on visual art development	Critical for narrative evolution	Divergence: Different relationships with language development
Evolutionary Timing	Gradual development over human evolution	Linked to language evolution, potentially more recent	Divergence: Potentially different evolutionary timelines

We found the following in our analysis of the table comparing visual and narrative arts:

- Origins : Both visual and narrative arts have ancient origins
  - Visual arts: Traced back to Paleolithic artifacts and cave paintings over 100,000 years ago
  - Narrative arts: Pre-date writing, agriculture, and permanent settlement
- Cognitive foundations : Different cognitive prerequisites emphasized for each art form
  - Visual arts: Associated with visual cortex and visuo-spatial brain area development
  - Narrative arts: Linked to event comprehension, memory, and imagination
- Role of language : Different relationships with language development
  - Visual arts: Language potentially influences development
  - Narrative arts: Language described as critical for evolution
- Evolutionary timing : Potentially different evolutionary timelines
  - Visual arts: Gradual development over human evolution
  - Narrative arts: Linked to language evolution, potentially more recent
- Convergence/Divergence :
  - One point of convergence: Ancient origins
  - Three points of divergence: Cognitive foundations, relationship with language, and evolutionary timing

## Cognitive Mechanisms and Adaptations

Theme	Visual Arts Evidence	Narrative Arts Evidence	Theoretical Convergence/Divergence
Pattern Recognition	Critical for visual art creation and appreciation	Important for narrative structure and comprehension	Convergence: Both rely on pattern recognition
Imagination	Crucial for creating images from "mind's eye"	Essential for narrative creation and engagement	Convergence: Both require imaginative capacities
Social Cognition	Enhanced through visual art creation and sharing	Sharpened through storytelling and narrative engagement	Convergence: Both enhance social cognitive abilities
Memory	Important for visual art techniques and symbolism	Critical for narrative creation and transmission	Convergence: Both rely on and enhance memory
Spatial Cognition	Crucial for 3D art and visual perspective	Important for narrative scene-setting and description	Divergence: Different emphasis and application

We found five cognitive themes common to both visual and narrative arts:

1. Pattern Recognition
2. Imagination
3. Social Cognition
4. Memory
5. Spatial Cognition

For 4 out of 5 themes (Pattern Recognition, Imagination, Social Cognition, and Memory), we found theoretical convergence between visual and narrative arts. For Spatial Cognition, we found a theoretical divergence.

In visual arts:

- Pattern recognition: Critical for creation and appreciation
- Imagination: Crucial for creating images from the "mind's eye"
- Social cognition: Enhanced through creation and sharing
- Memory: Important for techniques and symbolism
- Spatial cognition: Crucial for 3D art and visual perspective

In narrative arts:

- Pattern recognition: Important for structure and comprehension
- Imagination: Essential for creation and engagement
- Social cognition: Sharpened through storytelling and engagement
- Memory: Critical for creation and transmission
- Spatial cognition: Important for scene-setting and description

The main divergence we found was in the application of spatial cognition, with different emphasis between visual and narrative arts.

## Social Functions and Benefits

Theme	Visual Arts Evidence	Narrative Arts Evidence	Theoretical Convergence/Divergence
Social Cohesion	Visual art as a communication signal for cooperation	Storytelling enhances group bonding and cooperation	Convergence: Both promote social cohesion
Information Sharing	Visual symbols convey complex social information	Narratives efficiently transmit cultural knowledge	Convergence: Both facilitate information transfer
Emotional Regulation	Visual art creation and appreciation can reduce anxiety	Narratives help process and regulate emotions	Convergence: Both contribute to emotional regulation
Sexual Selection	Visual aesthetics may influence mate choice	Storytelling skills could be attractive to potential mates	Convergence: Both potentially involved in sexual selection
Cultural Identity	Visual symbols contribute to group identity	Shared narratives reinforce cultural identity	Convergence: Both strengthen cultural identity

We found evidence for five main themes in both visual and narrative arts:

1. Social Cohesion :

- Visual arts: Serve as a communication signal for cooperation
- Narrative arts: Enhance group bonding and cooperation

2. Information Sharing :

- Visual arts: Convey complex social information
- Narrative arts: Efficiently transmit cultural knowledge

3. Emotional Regulation :

- Visual arts: Creation and appreciation can reduce anxiety
- Narrative arts: Help process and regulate emotions

4. Sexual Selection :

- Visual arts: Aesthetics may influence mate choice
- Narrative arts: Storytelling skills could be attractive to potential mates

5. Cultural Identity :

- Visual arts: Symbols contribute to group identity
- Narrative arts: Shared narratives reinforce cultural identity

We found convergence between visual and narrative arts for all five themes. Both art forms were reported to promote social cohesion, facilitate information transfer, contribute to emotional regulation, potentially play a role in sexual selection, and strengthen cultural identity.



We found no mention of divergences between visual and narrative arts in the reported data. All themes showed theoretical convergence between the two art forms.

## Comparative Analysis

### Shared Evolutionary Foundations

Evolutionary Feature	Visual Arts Expression	Narrative Arts Expression	Theoretical Implications
Cognitive Play	Exploration of visual patterns and forms	Creation and engagement with fictional scenarios	Art as an extension of adaptive cognitive play behaviors
Pattern Recognition	Identification and creation of visual symmetry and structure	Recognition and creation of narrative structures	Fundamental cognitive ability underlying both art forms
Social Signaling	Visual symbols as markers of group identity	Narratives as vehicles for social norms and values	Art as a mechanism for social communication and cohesion
Emotional Expression	Visual representation of emotional states	Narrative exploration of emotional experiences	Art as a tool for emotional regulation and empathy
Cultural Transmission	Visual traditions passed down generations	Oral traditions and storytelling across generations	Art as a vehicle for cultural inheritance and evolution

We found 5 evolutionary features related to both visual and narrative arts:

1. Cognitive Play
2. Pattern Recognition
3. Social Signaling
4. Emotional Expression
5. Cultural Transmission

For Visual Arts, we found:

- 1 instance each of exploration, identification, creation, symbols, representation, and traditions

For Narrative Arts, we found:

- 2 instances of creation
- 1 instance each of engagement, recognition, vehicles, exploration, traditions, and storytelling

Both art forms showed similar evolutionary features, but with different expressions:

- Cognitive Play :
  - Visual arts: Exploration of patterns and forms
  - Narrative arts: Creation and engagement with fictional scenarios

- Pattern Recognition :
  - Visual arts: Identification and creation of visual symmetry and structure
  - Narrative arts: Recognition and creation of narrative structures
- Social Signaling :
  - Visual arts: Symbols as markers of group identity
  - Narrative arts: Vehicles for social norms and values
- Emotional Expression :
  - Visual arts: Representation of emotional states
  - Narrative arts: Exploration of emotional experiences
- Cultural Transmission :
  - Both forms: Traditions passed down through generations
  - Narrative arts: Specific mention of storytelling

We found no mention of features unique to only one art form; all identified evolutionary features were expressed in both visual and narrative arts.

### Art-Form Specific Adaptations

Evolutionary Feature	Visual Arts Expression	Narrative Arts Expression	Theoretical Implications
Spatial Cognition	Critical for 3D art and perspective	Less central, used for scene-setting	Visual arts may have co-evolved with spatial cognitive abilities
Temporal Sequencing	Limited to implied motion or series	Central to narrative structure and plot	Narrative arts may have co-evolved with temporal cognitive abilities
Language Dependence	Can exist independently of language	Heavily dependent on language development	Different relationships with language evolution
Symbolic Abstraction	Direct visual representation possible	Relies on linguistic symbols and metaphors	Different cognitive pathways for symbolism and abstraction
Immediate Perception	Instantly perceivable, spatially organized	Requires temporal unfolding and memory	Different cognitive processing demands

We analyzed the evolutionary features of visual and narrative arts expressions across 5 categories:

- Spatial Cognition :
  - Visual arts: Critical for 3D art and perspective
  - Narrative arts: Less central, used mainly for scene-setting
- Temporal Sequencing :

- Visual arts: Limited to implied motion or series
- Narrative arts: Central to narrative structure and plot
- Language Dependence :
  - Visual arts: Can exist independently of language
  - Narrative arts: Heavily dependent on language development
- Symbolic Abstraction :
  - Visual arts: Direct visual representation possible
  - Narrative arts: Relies on linguistic symbols and metaphors
- Immediate Perception :
  - Visual arts: Instantly perceivable and spatially organized
  - Narrative arts: Requires temporal unfolding and memory

We found theoretical implications suggesting:

- Possible co-evolution of visual arts with spatial cognitive abilities
- Possible co-evolution of narrative arts with temporal cognitive abilities
- Different relationships between each art form and language evolution
- Distinct cognitive pathways for symbolism and abstraction in each art form
- Different cognitive processing demands for each art form

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