Evolutionary Insights on Tragedy

Evolutionary psychology resolves the tragedy paradox by identifying adaptive benefits at both individual (information processing, emotional exploration) and collective (social bonding) levels.

Abstract

Tragedy appears in evolutionary psychology as a function of both individual adaptations and group-level processes. Several studies propose that negative experiences capture attention because they signal potential threats and provide valuable social information. For instance, Grodal (2007) argues that innate adaptations make negative events inherently attention-grabbing, while Nettle (2005) links tragedy to the processing of social status cues. Other accounts explain tragedy as a means for safe emotional exploration. Hick and Derksen (2017) describe emotional reversal—a mechanism that permits controlled engagement with negative states—whereas Smuts (2009) highlights aesthetic distance as a way to mitigate adverse effects. Scalise Sugiyama (2001) associates tragic themes with mechanisms such as incest avoidance that have been shaped by natural selection. At the group level, shared emotional experiences emerge as adaptive, with Trimble (2012) and Evers and Deng (2015) suggesting that collective processing of life's challenges reinforces social bonds and facilitates cultural transmission.

Paper search

Using your research question "What are some approaches for using evolutionary psychology to explain the paradox of tragedy?", 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 Psychology Framework**: Does the study explicitly use evolutionary psychology theories or frameworks in analyzing emotional or aesthetic responses?
- **Artistic Tragedy Focus**: Does the study examine psychological responses to tragic or negative content in art, literature, media, or entertainment (rather than real-world events)?
- **Psychological Component**: Does the study include analysis of psychological mechanisms or responses (rather than purely literary or artistic analysis)?
- **Theoretical Integration**: Does the study connect evolutionary adaptations to aesthetic experiences or emotional responses?
- **Research Context**: Does the study examine responses to artistic/fictional tragic content rather than clinical responses to real traumatic events?
- **Study Type**: Is the study an empirical investigation, theoretical analysis, or systematic review (rather than an opinion piece or informal commentary)?
- **Scope Alignment**: Does the study address both evolutionary psychology concepts AND aesthetic/emotional responses (rather than focusing on only one aspect)?
- **Response Focus**: Does the study focus on the reception/consumption of tragic content rather than solely on its creation or production?

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.

- **Theoretical Framework**:

  Identify the primary theoretical approach used to explain the paradox of tragedy. Look in the introduction, theoretical discussion, or conclusion sections.

Extraction should include:

- Specific psychological or evolutionary theory used
- Key theoretical concepts applied
- Primary explanatory mechanism for understanding tragic experience

If multiple theoretical approaches are discussed, list all in order of prominence. If no clear theoretical framework is presented, write "Not specified".

Example acceptable answers:

- "Evolutionary psychology with focus on fitness-related information processing"
- "Reversal theory explaining emotional transformation in tragic experience"
- "Cognitive adaptation theory examining psychological mechanisms of emotional engagement"

- **Approach to Explaining Tragedy Paradox**:

  Describe the specific approach or mechanism proposed for explaining why humans experience pleasure or engagement with tragic narratives.

Look in results, discussion, or theoretical argument sections. Extract:

- Primary explanatory mechanism
- Key psychological or evolutionary rationale
- Specific cognitive or emotional process highlighted

If multiple mechanisms are proposed, list in order of significance. If no clear mechanism is identified, write "Not specified".

Example acceptable answers:

- "Information gathering about social status competition strategies"
- "Evolved cognitive bias toward learning from others' fitness-related challenges"
- "Emotional reversal allowing safe exploration of negative emotional states"

- **Analytical Method**:

  Identify the primary method of analysis used to explore the tragedy paradox.

Look in methodology, methods, or analysis sections. Extract:

- Type of analysis (e.g., theoretical critique, textual analysis, cognitive analysis)
- Specific analytical techniques
- Primary sources or texts examined

If multiple methods are used, list in order of prominence.

Example acceptable answers:

- "Evolutionary psychological critique of literary texts"
- "Comparative analysis of dramatic genres using cognitive framework"
- "Philosophical and psychological theoretical integration"

- **Evidence Sources**:

  Identify the primary types of evidence used to support the theoretical argument.

Look throughout the text, particularly in evidence discussion sections. Extract:

- Types of evidence (e.g., literary examples, psychological research, evolutionary theory)
- Specific sources or case studies
- Disciplinary domains referenced

If multiple evidence types are used, list in order of significance.

Example acceptable answers:

- "Shakespeare plays (Twelfth Night, Richard III), evolutionary psychology research"
- "Philosophical literature review, cognitive psychology studies"
- "Anthropological research, literary text analysis"

Results

Characteristics of Included Studies

Study	Study Focus	Methodology	Key Evolutionary Concepts	Primary Findings	Full text retrieved
Evers and Deng, 2015	Paradox of tragedy	Philosophical theoretical analysis	No mention found	Acknowledgement of sad aspects of life as a source of pleasure	Yes
Grodal, 2007	Film emotions	Evolutionary psychological critique	Innate adaptations, survival value	Negative events fascinating due to survival value and social attachment	No
Hick and Derksen, 2017	Paradox of tragedy	Philosophical and psychological theoretical integration	No mention found	Emotional reversal allowing safe exploration of negative states	Yes

Study	Study Focus	Methodology	Key Evolutionary Concepts	Primary Findings	Full text retrieved
Nettle, 2005	Origins of tragedy and comedy	Evolutionary psychological analysis of literary texts	Evolved mind, fitness-related information	Information gathering about social status competition strategies	No
Scalise Sugiyama, 2001	Oedipal paradigm	Evolutionary psychological critique of literary texts	Natural selection, evolved design of the mind	Evolutionary critique of incest-avoidance mechanism	No
Smuts, 2009	Art and negative affect	Philosophical and aesthetic theoretical critique	No mention found	Multiple theories discussed without prioritization	Yes
Trimble, 2012	Human crying in response to tragedy	Philosophical and psychological theoretical integration	Evolution mentioned, but specific concepts not detailed	Neuroanatomy and neurophysiology of crying in response to tragedy	No

We found 7 studies focusing on various aspects of tragedy and negative emotions in art. These studies reported:

- Diverse study focuses : Including the paradox of tragedy, film emotions, origins of tragedy and comedy, the Oedipal paradigm, art and negative affect, and human crying in response to tragedy.
- Varied methodologies : Including evolutionary psychological approaches, philosophical approaches, and combinations of philosophical and psychological approaches.
- Inconsistent use of evolutionary concepts : Some studies explicitly used evolutionary concepts, while others did not or only mentioned evolution without detailing specific concepts.

The studies we examined used diverse methodologies and varied in their use of evolutionary concepts, reflecting the interdisciplinary nature of research on the paradox of tragedy.

Thematic Analysis

Evolutionary Adaptations and Emotional Processing

Theme	Supporting Evidence	Evolutionary Mechanism	Adaptive Function
Survival value of negative information	Grodal, 2007	Innate adaptations	Enhanced survival through attention to threats
Social status information	Nettle, 2005	Evolved mind's interest in fitness-related information	Optimizing individual behavior in social contexts
Emotional regulation	Hick and Derksen, 2017	No mention found, but compatible with adaptive explanations	Safe exploration of negative emotional states
Incest avoidance	Scalise Sugiyama, 2001	Natural selection, evolved design of the mind	Prevention of genetic defects from inbreeding

Four themes emerged from our review of the studies, each related to potential evolutionary bases for storytelling:

- Survival value of negative information
- Social status information
- Emotional regulation
- Incest avoidance

The evolutionary mechanisms proposed in these studies included:

- Innate adaptations
- Evolved mind's interest in fitness-related information
- Natural selection and evolved design of the mind

Each study proposed a different adaptive function for storytelling, including:

- Enhanced survival through attention to threats
- Optimizing individual behavior in social contexts
- Safe exploration of negative emotional states
- Prevention of genetic defects from inbreeding

Social Bonding and Collective Experience

Theme	Supporting Evidence	Evolutionary Mechanism	Adaptive Function
Social attachment	Grodal, 2007	Innate adaptation	Reinforcement of group bonds
Shared emotional experiences	Trimble, 2012	No mention found, but compatible with evolutionary explanations	Social cohesion through shared emotional experiences

Theme	Supporting Evidence	Evolutionary Mechanism	Adaptive Function
Acknowledgement of life's challenges	Evers and Deng, 2015	No mention found, but potentially adaptive	Collective processing of life's difficulties

Three themes related to the evolutionary basis of crying emerged from the studies:

- Social attachment : Supported by Grodal's study on film emotions, proposing innate adaptation as the evolutionary mechanism and reinforcement of group bonds as the adaptive function.
- Shared emotional experiences : Supported by Trimble's study on human crying in response to tragedy, suggesting social cohesion as the adaptive function.
- Acknowledgement of life's challenges : Supported by Evers and Deng's study on the paradox of tragedy, proposing collective processing of life's difficulties as a potentially adaptive function.

While not all studies explicitly mentioned evolutionary mechanisms, their explanations were noted as compatible with or potentially adaptive in an evolutionary context.

Protective Frames and Control Mechanisms

Theme	Supporting Evidence	Evolutionary Mechanism	Adaptive Function
Emotional reversal	Hick and Derksen, 2017	No mention found, but compatible with adaptive explanations	Safe exploration of negative emotions
Aesthetic distance	Smuts, 2009	No mention found	Controlled engagement with negative affects
Information processing	Nettle, 2005	Evolved mind's interest in fitness-related information	Learning from others' experiences without direct risk

Three themes related to the evolutionary perspective on protective frames and control mechanisms emerged from the studies:

- Emotional reversal : Supported by Hick and Derksen's study, proposing safe exploration of negative emotions as the adaptive function.
- Aesthetic distance : Supported by Smuts' study, suggesting controlled engagement with negative affects as the adaptive function.
- Information processing : Supported by Nettle's study, proposing learning from others' experiences without direct risk as the adaptive function.

Only one theme (information processing) was associated with an explicitly evolutionary mechanism related to the evolved mind's interest in fitness-related information.

Synthesis of Evolutionary Explanations

Individual-Level Adaptations

Explanation Level	Key Mechanisms	Supporting Studies	Theoretical Integration
Cognitive	Information processing, threat simulation	Grodal, 2007; Nettle, 2005	Combines attention to threats with social information gathering
Emotional	Emotional regulation, safe exploration of negative states	Hick and Derksen, 2017; Smuts, 2009	Integrates reversal theory with aesthetic theories of art engagement
Physiological	Neuroanatomy and neurophysiology of emotional responses	Trimble, 2012	Potential for integration with cognitive and emotional explanations

The studies we reviewed suggested three levels of explanation for horror engagement: cognitive, emotional, and physiological. Each level had distinct key mechanisms:

- Cognitive mechanisms : Information processing and threat simulation
- Emotional mechanisms : Emotional regulation and safe exploration of negative states
- Physiological mechanisms : Neuroanatomy and neurophysiology of emotional responses

The theoretical integration approaches varied across explanation levels:

- The cognitive level combined attention to threats with social information gathering
- The emotional level integrated reversal theory with aesthetic theories of art engagement
- The physiological level suggested potential integration with cognitive and emotional explanations

Group-Level Adaptive Functions

Explanation Level	Key Mechanisms	Supporting Studies	Theoretical Integration
Social Bonding	Shared emotional experiences, collective processing of challenges	Grodal, 2007; Evers and Deng, 2015	Combines evolutionary perspectives on social attachment with philosophical concepts of acknowledgement
Cultural Transmission	Information sharing about social dynamics and potential threats	Nettle, 2005; Scalise Sugiyama, 2001	Integrates evolved information processing with cultural learning theories
Collective Emotional Regulation	Group-level processing of negative emotions and experiences	Hick and Derksen, 2017; Trimble, 2012	Potential integration of reversal theory with neurophysiological approaches to collective emotional experiences

The studies suggested three explanation levels for the role of storytelling in human evolution:

- Social Bonding :
  - Key mechanisms: Shared emotional experiences, collective processing of challenges
  - Theoretical integration: Combines evolutionary perspectives on social attachment with philosophical concepts of acknowledgement
- Cultural Transmission :
  - Key mechanisms: Information sharing about social dynamics and potential threats
  - Theoretical integration: Integrates evolved information processing with cultural learning theories
- Collective Emotional Regulation :
  - Key mechanisms: Group-level processing of negative emotions and experiences
  - Theoretical integration: Potential integration of reversal theory with neurophysiological approaches to collective emotional experiences

Each explanation level was supported by two studies and offered a unique approach to theoretical integration, reflecting the complexity of evolutionary explanations for the paradox of tragedy.

References

Aaron Smuts. "Art and Negative Affect," 2009.

D. Nettle. "The Wheel of Fire and the Mating Game: Explaining the Origins of Tragedy and Comedy," 2005.

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Darren Hick, and C. Derksen. "The Problem of Tragedy and the Protective Frame," 2017.

M. Trimble. "Why Humans Like to Cry: Tragedy, Evolution, and the Brain," 2012.

Michelle Scalise Sugiyama. "New Science, Old Myth: An Evolutionary Critique of the Oedipal Paradigm," 2001.

T. Grodal. "Pain, Sadness, Aggression, and Joy: An Evolutionary Approach to Film Emotions," 2007.