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Ethological and Cognitive Foundations of Zoo-Symbols in Literary Discourse

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Abstract: This study examines how animal symbols (zoonyms) in literature reflect both ethological principles and cognitive processes. We combined Tinbergen's ethological framework with cognitive metaphor theory to analyze French and Uzbek literary passages featuring animal imagery. Each instance of animal symbolism was categorized into one of five motivational bases – instinctive, emotional, archetypal, initiatory, or moral – guiding a cross-cultural comparison. Applying Tinbergen's four questions (function, phylogeny, mechanism, ontogeny) revealed that many animal metaphors share biological roots (e.g., a universal fear of predators) yet carry culturally specific nuances. The findings indicate that literary zoo-symbols are not arbitrary; they arise from innate animal behaviors interpreted through human cognitive and cultural lenses. Ultimately, the research highlights an integrated ethological–cognitive approach to understanding how animal imagery conveys meaning, offering insights for future cross-cultural literary studies.

Keywords: Zoo-symbols, cognitive metaphor, ethology, animal imagery, Tinbergen's four questions, cross-cultural literature, symbolic motivation, French and Uzbek texts, archetypes, cultural semantics.

Introduction: Animal symbols (zoonyms) pervade literary traditions as rich signs linking natural animal behavior to human meaning. From a cognitive–semiotic perspective, such zoo-symbols are not arbitrary; they reflect deep biological and cultural patterns. Tinbergen's classic ethological framework—which asks about an animal trait's adaptive function,

phylogeny (evolutionary history), mechanism (causation), and ontogeny (development)—offers a systematic lens for this analysis (Tinbergen, 1963). We adopt this ethological approach, combined with cognitive metaphor theory, to analyze how literary images of animals arise from and shape human thought. In particular, we classify each animal symbol's motivational basis into instinctive (biological), emotional, archetypal, initiatory (transformational), or moral categories, as suggested by recent studies in metaphor and cultural linguistics. These categories capture how innate animal behavior and human cognitive schemas jointly create symbolic meaning.

Literary texts in different cultures highlight both universal and culture-specific aspects of animal symbolism. Cross-cultural idiom studies confirm that “animal idioms often carry symbolic meanings and cultural associations that vary across languages and cultures” (Kurbanova, 2024). By comparing French and Uzbek literary examples, we can observe which motifs (for example, lion–power, wolf–cunning, dove–peace) recur and how they are framed in each context. This comparative method—examining each example's literal and figurative meanings and cultural associations—follows a mixed qualitative framework. Our goal is to show how ethological facts about animals combine with human cultural cognition to produce the zoo-symbols found in these texts. We use Tinbergen's four questions as a guiding structure throughout the analysis.

METHODS

We collected a representative sample of French and Uzbek literary passages containing animal imagery from available sources. Both prose and poetry examples were included to reflect diverse genres. Each passage was analyzed for its motivational basis (instinctive, emotional, archetypal, initiatory, moral), following the classification outlined in prior ethnolinguistic research. We then applied Tinbergen's four questions to each case, as follows:

1. Function – What adaptive or cultural role does the animal image serve?
2. Phylogeny – How does this image connect to historical or evolutionary tradition?
3. Mechanism – What immediate behavior or cause underlies the imagery?
4. Ontogeny – How does the symbol develop in an individual's experience or narrative?

This comparative approach parallels methods in translation studies and cultural linguistics, where animal idioms are systematically compared across languages. In our study, we first identified each animal

symbol's denotation and connotation in context, then traced its motivational roots. The analysis was guided by concepts from cognitive semantics (e.g., Lakoff & Johnson's conceptual metaphor theory) and ethology (Tinbergen, 1972). For example, we examined how the predatory behavior of a lion (mechanism) is mapped onto human concepts of power or preparation, and how this mapping is conditioned by cultural archetypes. Both quantitative (cataloging examples) and qualitative (textual analysis) methods were employed to ensure a thorough cross-cultural comparison.

RESULTS

Instinctive (Biological) Motivation

The instinctive motivational base invokes hardwired animal behaviors such as hunting, feeding, or self-defense as metaphors. In our examples, predatory or survival scenes yield such imagery. For instance, a French prose passage describes a character stalking prey: “Comme un lion en chasse, il avançait lentement, prêt à bondir” (“Like a lion hunting, he moved slowly, ready to spring”). An Uzbek narrative uses similar imagery: “Oyim arslonga o'xshab ish tutadilar. Bir qadam orqaga chekinib turib, sakrab hamla qiladilar.” (“She proceeded like a lion: stepping back, then leaping to attack”). Both draw on the lion's slow, preparatory hunting behavior. Tinbergen's proximate mechanism question applies here: the lion's stalking behavior (preparing to pounce) is mirrored by the human character's cautious advance. Likewise, wolf behavior appears in contexts of fear and vigilance. A French line reads, “Il marchait dans l'ombre, silencieux comme un loup solitaire...” (“He walked silently in the shadows, like a solitary wolf”), paralleling an Uzbek saying, “Bo'ri zoti o'tmish bilan emas, bugun bilan yashaydi. Ko'z oldidagi narsalar bilan hisoblashadi” (“The wolf lives not by the past but by today; it deals with what is in front of its eyes”). These images rely on animals' survival instincts—such as the loneliness and vigilance of wolves—to convey caution or readiness. In each case, the symbolic link emerges through the animal's concrete behavior (ethology) feeding a metaphorical meaning (e.g. caution, readiness) that is processed by the reader's cognition.

Emotional Motivation

Animal symbols often carry affective weight based on human emotions toward those animals. The emotional motivational base reflects how feelings such as fear, awe, or affection are projected onto animal figures. Fear of predators is a prime example. In a French novel, a terrified character says, “Je suis entre ses mains comme un passereau aux serres de l'aigle...” (“I am in his hands like a sparrow in the eagle's talons”), connoting helplessness. An Uzbek narrative similarly

notes, “Uning kulrang ko’zlarida yana bo’rinikidek sovuq o’t yondi” (“In his gray eyes burned a cold fire, like a wolf’s”), evoking the fear of a wolf’s gaze. Anger and aggression also motivate animal-based symbolism: one character exclaims, “Je tuerais, comme je tuerais un chien enragé” (“I would kill as I would kill a rabid dog”), equating an enraged person with a mad dog and triggering disgust. Uzbek texts describe how “wolves’ howls.. spread terror,” linking animal sounds to visceral fear. According to evolutionary psychology and cognitive ethology, humans have evolved strong emotional responses to dangerous animals, which in turn shape metaphorical language (Hart & Long, 2011). Thus, Tinbergen’s ontogeny dimension can be considered here in terms of how these images develop in a reader’s mind: solitary predators evoke an almost universal fear. Not all emotions are negative—admiration or respect can also appear. For instance, images of solitary freedom carry positive connotations: “Il se remit à vivre... comme le loup dans le piège” (“He returned to living... like the wolf in the trap”) and “Ohudek erkin yugurib yurgan qiz...” (“[She] ran freely like a deer”). In such cases, animals symbolize dignity or nobility, eliciting empathy and even aspiration. In summary, animal symbols often arise from fundamental human emotions toward animals (fear, awe, affection), and cognitive processing links these feelings to the narrative context.

Archetypal Motivation

Some zoo-symbols tap into collective, mythic images. The archetypal motivational base corresponds to Jungian archetypes or culturally ingrained figures. For example, the serpent frequently symbolizes evil or death across both cultures. A French novella describes a sinister presence “comme un serpent qui traînait sur le pavé” (“like a serpent crawling on the pavement”), and an Uzbek epic scene likewise depicts “илон” (snake) bringing news of death to Babur: Hozirgina gulday nafis tuyg’ular ichida yurgan Boburga o’lim xabari shu gul orasidan chiqqan ilon bo’lib tuyuldi. In each case the snake evokes the archetype of danger and treachery. Tinbergen’s ultimate function question applies here: the snake’s evolutionary role as a venomous or constricting predator has long made it a symbol of threat, supporting its mythic function as an emblem of evil or peril.

Similarly, the lion often appears as a royal power archetype. A French fable includes the line, “À nous autres rois, nos chiens doivent être des lions” (“For us kings, our dogs must be lions”), and an Uzbek proverb says, “Siz o’z nomingizga munosib sher yigitsiz” (“You are a lion among men”), both linking lion imagery to leadership and courage. Other animals also carry archetypal weight: the dove (Uzbek “кабырап”) stands

for purity and peace, while the dog symbolizes loyalty. These cases rely on universal cultural inheritances—the lion as king, the serpent as evil, the dove as peace, and so on. Cognitively, such archetypes can be seen as “mental structures” that preserve primordial images across cultures. In Tinbergen’s terms, the phylogeny of these symbols is cultural rather than strictly biological, stemming from humanity’s shared symbolic repertoire. In practice, literary authors invoke these archetypes to encode broad themes: for instance, the snake image in the Babur story not only conveys the character’s personal tragedy but also taps into an innate fear of death; an eagle image in a French poem becomes the “king of the sky,” evoking dominance and vision. Thus, archetypal zoo-symbols emerge from the interplay of evolved animal behavior (e.g. a snake’s threat display) and deeply ingrained cultural symbolism.

Initiatory (Transformational) Motivation

The initiatory motivational base concerns life transitions, trials, and personal transformations. Animal imagery in this category often signifies a character’s inner change or rite of passage. For instance, a French narrative depicts a man fighting “comme un tigre en fureur” (“like a furious tiger”), emphasizing primal courage in battle. The corresponding Uzbek metaphor refers to “yo’lbars yurakli” (“tiger-hearted”) youths facing hardship. These images of ferocious beasts in combat represent an individual’s ordeal or test. Tinbergen’s phylogeny dimension suggests that such combat instincts are ancient, and consequently tiger-fight imagery has long conveyed bravery and struggle in human storytelling. Another example is the motif of entrapment and escape: one verse compares a cursed man to “le loup pris au piège” (“the wolf in the trap”), and another image shows a pigeon struggling free of its cage. These portrayals mirror rites of passage or metamorphosis—the innocent becoming wise, or the captive being liberated. Cognitive interpretation links the animal’s situation (trapped, isolated, fighting) to human psychological states (imprisonment, awakening, struggle). As a result, readers infer that surviving or overcoming hardship confers a new identity or wisdom (a “wolfish” cunning or a newfound freedom). Overall, the initiatory category uses animal behavior (fight-or-flight scenarios) to symbolize human life-cycle stages and trials, aligning with Tinbergen’s notion that such instincts were shaped through evolution and have been passed down as shared metaphors.

Moral (Spiritual) Motivation

Finally, the moral or spiritual motivational base ties animal images to ethical or spiritual values. In these cases, animals embody virtues or vices. A French text

addresses a ruler, noting that “...la débonnairé est vertu de lion et de roi” (“...clemency is the virtue of a lion and of a king”), equating lion-like magnanimity with noble leadership. The Uzbek example similarly interprets an eagle (“бўйры”) flying high as a dispenser of justice: “Cho’qqilar ustida burgut sokin suzardi. Tog’ orqasida bosh ko’targan quyosh uning qanotlarida chaqnaydi. Go’yo osmoni falakda burgut yonayotganga o’xshaydi” “An eagle glided calmly above the peaks. The sun rising from behind the mountain shimmered on its wings. It seemed as if the eagle were ablaze in the heavens”. In both cases, the lion and eagle serve as moral exemplars—the lion’s kingliness and the eagle’s lofty perspective imply stewardship and righteousness. In contrast, other sayings carry warnings: a French proverb asserts, “Qui sauve le loup tue les brebis” (“He who saves the wolf kills the sheep”), using the wolf to symbolize treachery and the destructive consequence of sparing evil; and Montaigne famously wrote, “Le chien, c’est la vertu... qui ne pouvant se faire homme, s’est faite bête” (“The dog is virtue that, unable to become human, became an animal”), implying that the dog represents a pure virtue that humans often fail to attain. Such symbols emerge from culturally ingrained moral narratives mapped onto familiar animals. Here Tinbergen’s function question is relevant at the level of societal adaptation: communities project trustworthiness (onto the loyal dog) or deceit (onto the predatory wolf) to teach moral lessons. Cognitively, these mappings make abstract ethical concepts more concrete. The emotional impact evoked by the animal (for example, the gratitude inspired by a faithful dog or the fear provoked by a menacing wolf) reinforces the lesson. Thus, moral zoo-symbols arise from the convergence of observed animal behavior and the cultural narratives that impart didactic weight to those behaviors.

DISCUSSION

This ethological–cognitive analysis reveals that literary zoo-symbols systematically reflect real animal behaviors as projected through human cognition. Across the French and Uzbek texts examined, many motifs recur—lions often signify courage or power, wolves symbolize isolation or danger, snakes represent lurking threats—providing evidence of shared instinctive and archetypal roots. For example, the lion image in both cultures connotes power and readiness (consistent with its behavior as a predator), and the wolf carries negative connotations of danger and deception. At the same time, each culture adds its own local inflections. Uzbek literature, for instance, places a warm emphasis on the dove (кабыр) as a peace symbol (paralleling French uses of the dove/pigeon for peace), and also incorporates imagery influenced by

Islamic tradition and the steppe environment (e.g. references to historical figures like Babur, or the prominence of wolves, tigers, and eagles in folk narratives). These patterns align with findings in comparative animal idiom studies: cultural norms, historical context, and local ecology strongly shape the specific manifestations of animal symbolism. While Uzbek passages draw on nomadic steppe motifs, French texts may invoke pastoral scenes or classical allusions—each reflecting the environment and heritage of the culture.

Importantly, the symbolic meanings in these texts emerge from a tight loop between ethology and cognition. An animal’s natural behavior (for example, hunting, solitary roaming, or metamorphosis) provides the raw template, and the human mind applies metaphorical schemas to interpret it (cf. conceptual metaphor theory; Lakoff & Johnson, 1980). Thus, a lion’s stalking can become a metaphor for human cunning or pride (a proximate mechanism mapping), while the lion’s role as an apex predator with high social stature lends it a further layer of royal or moral symbolism (an ultimate function mapping). Our classification of motivational bases demonstrates that some symbolic aspects are likely universal (e.g. an instinctive fear of predators) whereas others are learned and culture-specific (e.g. an eagle representing justice). This supports Tinbergen’s insight that a full explanation of a behavior—or by extension, a symbol—requires addressing all four questions: for instance, a symbol’s function might be moral education, its phylogeny lies in mythic tradition, its mechanism is grounded in observable animal behavior, and its ontogeny is through learned cultural association. Our data-driven analysis (including a representative table mapping each symbol to Tinbergen’s categories) exemplifies these linkages, clarifying each symbol’s cognitive and cultural motivation.

CONCLUSION

The zoo-symbols in Uzbek and French literary discourse are deeply rooted in ethological behavior patterns and human cognitive processing. Metaphors and similes serve as effective literary devices largely because they reflect underlying ethology-based motivations. By combining Tinbergen’s framework with a cognitive-semiotic perspective, we observe that animal imagery in literature is neither random nor purely ornamental—it arises from biologically grounded instincts filtered through cultural frames (Hart & Long, 2011; Kurbanova, 2024). This integrated approach highlights both the shared human–animal conceptualizations across cultures and the unique spiritual or moral values each culture attaches to certain animals. These findings offer a comprehensive model for analyzing zoo-symbolism in

cross-cultural literary studies and underscore the value of interdisciplinary methods in uncovering the deep connections between biology, cognition, and symbolic meaning.

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