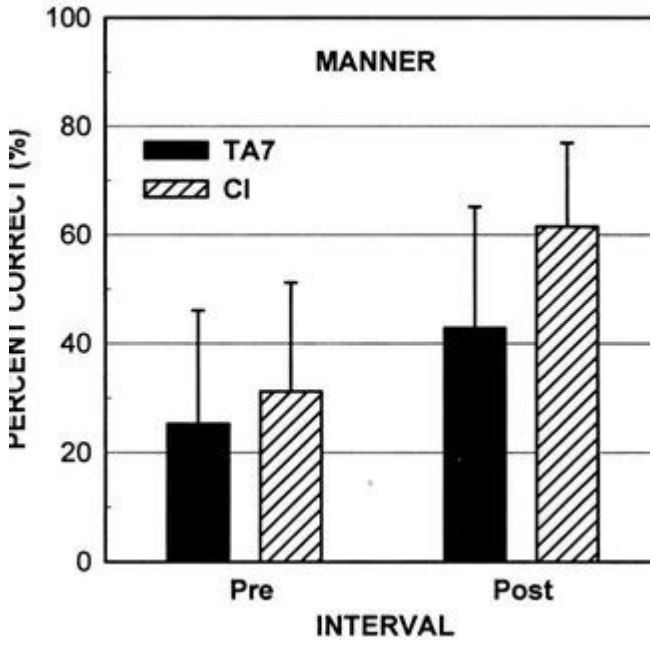
# Imitative Feature In Biology




## Imitative Features in Biology: A Deep Dive into Mimicry and Deception

Introduction:

The natural world is a breathtaking tapestry of survival strategies, and among the most fascinating are imitative features. From the viceroy butterfly mimicking the poisonous monarch to the orchid mimicking a female wasp to attract males, the ability to imitate another organism or object provides a significant evolutionary advantage. This post will explore the diverse world of imitative features in biology, examining the different types of mimicry, their evolutionary mechanisms, and the ecological roles they play. We'll delve into the intricate details of how these deceptive strategies contribute to survival, reproduction, and the overall dynamics of ecosystems. Get ready to be amazed by the ingenious ways nature employs imitation!

## Types of Mimicry in Biology

Mimicry, the close resemblance of one organism to another or to an object in its environment, falls into several key categories:

# 1. Batesian Mimicry:

This classic form of mimicry involves a harmless species (the mimic) evolving to resemble a harmful or unpalatable species (the model). Predators learn to avoid the model through negative reinforcement (a bad experience with the model). The mimic benefits from this learned avoidance, even though it lacks the model's defenses. A prime example is the viceroy butterfly mimicking the poisonous monarch butterfly.

#### Evolutionary Drivers of Batesian Mimicry:

The effectiveness of Batesian mimicry hinges on the relative abundance of the model and mimic. If the mimic becomes too common, predators will encounter it more frequently, negating the protective effect. This leads to a constant evolutionary "arms race" between the mimic and predator, shaping the appearance and distribution of both.

# 2. Müllerian Mimicry:

Unlike Batesian mimicry, Müllerian mimicry involves multiple harmful or unpalatable species evolving to resemble each other. This mutual benefit arises because predators learn to avoid the entire group more quickly when they share a common warning signal. Think of various species of stinging wasps all exhibiting similar black and yellow stripes.

#### Advantages of Müllerian Mimicry:

Müllerian mimicry is highly efficient because it reduces the number of individual learning experiences needed for predator avoidance. The more species involved, the faster predators learn to avoid the shared warning signal, benefiting all participants.

# 3. Aggressive Mimicry:

In aggressive mimicry, a predator or parasite resembles a harmless organism to lure its prey or host. For instance, some anglerfish use a bioluminescent lure resembling a small fish to attract unsuspecting victims. Certain orchids mimic female insects to attract males for pollination.

#### Examples of Aggressive Mimicry:

Aggressive mimicry highlights the versatility of imitation in biological systems. The effectiveness depends on the degree of resemblance and the naivety of the prey or host. Evolution constantly refines these deceptive strategies, resulting in incredibly precise mimicry.

## 4. Automimicry:

This less-known form of mimicry involves a single species where one body part mimics another. This can be used for defense or to distract predators. For instance, a butterfly with eye spots on its wings might mimic the head of a much larger animal.

#### Distraction and Defense in Automimicry:

By creating the illusion of a different body plan or a different, larger creature, the organism can potentially confuse or deter predators, giving it a crucial advantage in escaping attack.

# The Evolutionary Mechanisms Driving Imitative Features

The evolution of mimicry is a complex process shaped by natural selection. Genetic mutations that lead to increased resemblance to a model organism will confer a survival advantage, leading to higher reproductive success and the spread of the advantageous trait through the population. This process is often influenced by environmental factors and the selective pressures exerted by predators and prey.

# Ecological Significance of Mimicry

Mimicry plays a vital role in shaping ecological interactions. It impacts predator-prey dynamics, influences species distribution and abundance, and even contributes to the evolution of new species. Understanding mimicry offers valuable insights into the complex interplay of organisms within their environment.

# Conclusion

The diverse array of imitative features found in the biological world is a testament to the power of natural selection. From the elaborate camouflage of insects to the deceptive lures of predators, mimicry demonstrates the remarkable ingenuity of evolution. The study of mimicry continues to unveil new insights into the fascinating world of adaptation, revealing the intricate relationship between organisms and their environments. By understanding the principles of mimicry, we can gain a deeper appreciation for the beauty and complexity of life on Earth.

FAQs:

1. Can mimicry be imperfect? Yes, imperfect mimicry is common. The mimic doesn't always perfectly resemble the model, especially in Batesian mimicry, as perfect mimicry isn't always necessary for the survival advantage.

2. How is mimicry studied? Researchers use various methods, including observation in the wild, laboratory experiments, and genetic analysis to study the evolution and ecological consequences of mimicry.

3. Are there any examples of mimicry in plants? Absolutely! Many plants use mimicry to attract pollinators (like orchids mimicking insects) or to deter herbivores.

4. Can mimicry evolve rapidly? Yes, under strong selective pressure, mimicry can evolve surprisingly quickly. This is often observed in situations where a new predator or a new mimic emerges.

5. What are some future research directions in mimicry? Future research might focus on the genetic basis of mimicry, exploring how specific genes contribute to the development of mimicking traits, and understanding the role of mimicry in the context of climate change and habitat loss.

**imitative feature in biology:** The Imitative Mind Andrew N. Meltzoff, Wolfgang Prinz, 2002-04-18 Imitation guides the behaviour of a range of species. Scientific advances in the study of imitation at multiple levels from neurons to behaviour have far-reaching implications for cognitive science, neuroscience, and evolutionary and developmental psychology. This volume, first published in 2002, provides a summary of the research on imitation in both Europe and America, including work on infants, adults, and nonhuman primates, with speculations about robotics. A special feature of the book is that it provides a concrete instance of the links between developmental psychology, neuroscience, and cognitive science. It showcases how an interdisciplinary approach to imitation can illuminate long-standing problems in the brain sciences, including consciousness, self, perception-action coding, theory of mind, and intersubjectivity. The book addresses what it means to be human and how we get that way.

**imitative feature in biology: The Oxford Handbook of Developmental Psychology, Vol. 1** Philip David Zelazo, 2013-03-21 This handbook provides a comprehensive survey of what is now known about psychological development, from birth to biological maturity, and it highlights how cultural, social, cognitive, neural, and molecular processes work together to yield human behavior and changes in human behavior.

**imitative feature in biology:** Behindlings Nicola Barker, 2009-10-13 Spurting with kinetic energy, nasty wit, and kindness to animals, Wesley ought to be a star. Or so it seems to the Behindlings -- followers who nip at his heels, turn up everywhere he goes, and lie in wait for him around every corner. They skulk through the dreary streets of their tiny English town, gathering their own scabby intentions, irritating habits, and weird manners, burying all differences in the common pursuit of their true prize, their Wesley. In Behindlings, the inimitable and ungovernable Nicola Barker takes her most compelling character to date, gives him his head and her novel, and sees him run off with her readers.

**imitative feature in biology: The Meme Machine** Susan Blackmore, 2000-03-16 Humans are extraordinary creatures, with the unique ability among animals to imitate and so copy from one another ideas, habits, skills, behaviours, inventions, songs, and stories. These are all memes, a term first coined by Richard Dawkins in 1976 in his book The Selfish Gene. Memes, like genes, are replicators, and this enthralling book is an investigation of whether this link between genes and memes can lead to important discoveries about the nature of the inner self. Confronting the deepest questions about our inner selves, with all our emotions, memories, beliefs, and decisions, Susan Blackmore makes a compelling case for the theory that the inner self is merely an illusion created by

the memes for the sake of replication.

**imitative feature in biology: Evolution of the Human Brain: From Matter to Mind** , 2019-11-06 Evolution of the Human Brain: From Matter to Mind, Volume 250 in the Progress in Brain Research, series documents the latest developments and insights about the origin and evolution of the human brain and mind. Specific sections in this new release include Evolution and development of the human cerebral cortex, Functional connectivity of the human cerebral cortex, Lateralization of the human cerebral cortex, Life history strategies and the human cerebral cortex, Evolution of the modern human brain, On the nature and evolution of the human mind, Origin and evolution of human cognition, Origin and evolution of human consciousness, and more. - Presents insights on molecular and cellular mechanisms of human brain evolution - Provides a better understanding of the origin and evolution of the human mind - Includes information of the neural organization and functional connectivity of the cerebral cortex

**imitative feature in biology: Passion In The Peak** John Buxton Hilton, 2012-07-19 When Lord Furnival, a left-of-centre dilettante, tries to stage a musical version of the Oberammergau Passion Play in the High Peak of Derbyshire, he does not foresee what strife and tension he is setting in motion. Petty thefts, a peeping Tom, artistic jealousies, a vendetta against Mary Magdalene – the record of crime culminates in the murder of the hyped rock singer who is brought out of disgraced retirement to play the Christ part. Kenworthy is called in as a private consultant to 'protect the interests of the management' and finds himself involved with a bewildering array of eccentrics: Jimmy Lindop, a sound technician with old scores to settle; Julian Harpur, a neurotic adolescent whose mother believes him a genius; Alfie Tandy, who has confessed to dozens of murders in his time, and who carries his worldly belongings about in an old banjo-case; Freddy Kershaw, a detective-constable who is suspended from duty for telling the truth; and Joan Culver, who is trying to straighten herself out about filial duty, sex and life. This is knotty a puzzle as Kenworthy and his reader have ever squared up to, as the case-work takes us out of Derbyshire into the squalid history of The Stalagmites, a failed rock group of London's swinging years. On the way we take a Hiltonian look at more than one level of contemporary society.

**imitative feature in biology: Newborn Imitation** Ruth Leys, 2020-07-30 Newborn imitation has recently become the focus of a major controversy in the human sciences. New studies have reexamined the evidence and found it wanting. Imitation has been regarded as a crucial capability of neonates ever since 1977, when two American psychologists first published experiments appearing to demonstrate that babies at birth are able to copy a variety of facial movements. The findings overturned decades of assumptions about the competence of newborns. But what if claims for newborn imitation are not true? Influential theories about the mechanisms underlying imitation, the role of mirror neurons, the nature of the self and of infant mental states, will all have to be modified or abandoned if it turns out that babies cannot imitate at birth. This Element offers a critical assessment of those theories and the stakes involved.

**imitative feature in biology:** *Transforming the Workforce for Children Birth Through Age 8* National Research Council, Institute of Medicine, Board on Children, Youth, and Families, Committee on the Science of Children Birth to Age 8: Deepening and Broadening the Foundation for Success, 2015-07-23 Children are already learning at birth, and they develop and learn at a rapid pace in their early years. This provides a critical foundation for lifelong progress, and the adults who provide for the care and the education of young children bear a great responsibility for their health, development, and learning. Despite the fact that they share the same objective - to nurture young children and secure their future success - the various practitioners who contribute to the care and the education of children from birth through age 8 are not acknowledged as a workforce unified by the common knowledge and competencies needed to do their jobs well. Transforming the Workforce for Children Birth Through Age 8 explores the science of child development, particularly looking at implications for the professionals who work with children. This report examines the current capacities and practices of the workforce, the settings in which they work, the policies and infrastructure that set qualifications and provide professional learning, and the government agencies

and other funders who support and oversee these systems. This book then makes recommendations to improve the quality of professional practice and the practice environment for care and education professionals. These detailed recommendations create a blueprint for action that builds on a unifying foundation of child development and early learning, shared knowledge and competencies for care and education professionals, and principles for effective professional learning. Young children thrive and learn best when they have secure, positive relationships with adults who are knowledgeable about how to support their development and learning and are responsive to their individual progress. Transforming the Workforce for Children Birth Through Age 8 offers guidance on system changes to improve the quality of professional practice, specific actions to improve professional learning systems and workforce development, and research to continue to build the knowledge base in ways that will directly advance and inform future actions. The recommendations of this book provide an opportunity to improve the quality of the care and the education that children receive, and ultimately improve outcomes for children.

**imitative feature in biology:** Imitation in Infancy Jacqueline Nadel, George Butterworth, 2011-02-17 First published in 1999, this book brings together the extensive modern evidence for innate imitation in babies. Modern research has shown imitation to be a natural mechanism of learning and communication which deserves to be at centre stage in developmental psychology. Yet the very possibility of imitation in newborn humans has had a controversial history. Defining imitation has proved to be far from straightforward and scientific evidence for its existence in neonates is only now becoming accepted, despite more than a century of enquiry. In this book, some of the world's foremost researchers on imitation and intellectual development review evidence for imitation in newborn babies. They discuss the development of imitation in infancy, in both normal and atypical populations and in comparison with other primate species, stressing the fundamental importance of imitation in human development, as a foundation of communication and a precursor to symbolic processes.

**imitative feature in biology:** Science And Human Behavior B.F Skinner, 2012-12-18 The psychology classic—a detailed study of scientific theories of human nature and the possible ways in which human behavior can be predicted and controlled—from one of the most influential behaviorists of the twentieth century and the author of Walden Two. “This is an important book, exceptionally well written, and logically consistent with the basic premise of the unitary nature of science. Many students of society and culture would take violent issue with most of the things that Skinner has to say, but even those who disagree most will find this a stimulating book.” —Samuel M. Strong, The American Journal of Sociology “This is a remarkable book—remarkable in that it presents a strong, consistent, and all but exhaustive case for a natural science of human behavior…It ought to be…valuable for those whose preferences lie with, as well as those whose preferences stand against, a behavioristic approach to human activity.” —Harry Prosch, Ethics

**imitative feature in biology: History, Metaphors, Fables** Hans Blumenberg, 2020-06-15 History, Metaphors, and Fables collects the central writings by Hans Blumenberg and covers topics such as on the philosophy of language, metaphor theory, non-conceptuality, aesthetics, politics, and literary studies. This landmark volume demonstrates Blumenberg's intellectual breadth and gives an overview of his thematic and stylistic range over four decades. Blumenberg's early philosophy of technology becomes tangible, as does his critique of linguistic perfectibility and conceptual thought, his theory of history as successive concepts of reality, his anthropology, or his studies of literature. History, Metaphors, Fables allows readers to discover a master thinker whose role in the German intellectual post-war scene can hardly be overestimated.

**imitative feature in biology:** *Social Motivation* Joseph P. Forgas, Kipling D. Williams, Simon M. Laham, 2005 Sample Text

**imitative feature in biology: Play, Playfulness, Creativity and Innovation** Paul Patrick Gordon Bateson, Paul Martin, 2013-07-11 Examines the role of playfulness in animal and human development, highlighting its links to creativity and, in turn, to innovation.

**imitative feature in biology:** *The Lost Second Book of Aristotle's* "*Poetics*" Walter Watson,

2012-06-27 Of all the writings on theory and aesthetics - ancient, medieval, or modern - the most important is indisputably Aristotle's Poetics, the first philosophical treatise to propound a theory of literature. The author offers a fresh interpretation of the lost second book of Aristotle's Poetics.

**imitative feature in biology:** *Social Learning In Animals* Cecilia M. Heyes, Bennett G. Galef Jr., 1996-05-23 The increasing realization among behaviorists and psychologists is that many animals learn by observation as members of social systems. Such settings contribute to the formation of culture. This book combines the knowledge of two groups of scientists with different backgrounds to establish a working consensus for future research. The book is divided into two major sections, with contributions by a well-known, international, and interdisciplinary team which integrates these growing areas of inquiry. - Integrates the broad range of scientific approaches being used in the studies of social learning and imitation, and society and culture - Provides an introduction to this field of study as well as a starting point for the more experienced researcher - Chapters are succinct reviews of innovative discoveries and progress made during the past decade - Includes statements of varied theoretical perspectives on controversial topics - Authoritative contributions by an international team of leading researchers

**imitative feature in biology: The Philosophical Review** Jacob Gould Schurman, James Edwin Creighton, Frank Thilly, Gustavus Watts Cunningham, 1899 An international journal of general philosophy.

**imitative feature in biology:** The Emergence and Evolution of Religion Jonathan H. Turner, Alexandra Maryanski, Anders Klostergaard Petersen, Armin W. Geertz, 2017-08-10 Written by leading theorists and empirical researchers, this book presents new ways of addressing the old question: Why did religion first emerge and then continue to evolve in all human societies? The authors of the book—each with a different background across the social sciences and humanities—assimilate conceptual leads and empirical findings from anthropology, evolutionary biology, evolutionary sociology, neurology, primate behavioral studies, explanations of human interaction and group dynamics, and a wide range of religious scholarship to construct a deeper and more powerful explanation of the origins and subsequent evolutionary development of religions than can currently be found in what is now vast literature. While explaining religion has been a central question in many disciplines for a long time, this book draws upon a much wider array of literature to develop a robust and cross-disciplinary analysis of religion. The book remains true to its subtitle by emphasizing an array of both biological and sociocultural forms of selection dynamics that are fundamental to explaining religion as a universal institution in human societies. In addition to Darwinian selection, which can explain the biology and neurology of religion, the book outlines a set of four additional types of sociocultural natural selection that can fill out the explanation of why religion first emerged as an institutional system in human societies, and why it has continued to evolve over the last 300,000 years of societal evolution. These sociocultural forms of natural selection are labeled by the names of the early sociologists who first emphasized them, and they can be seen as a necessary supplement to the type of natural selection theorized by Charles Darwin. Explanations of religion that remain in the shadow cast by Darwin’s great insights will, it is argued, remain narrow and incomplete when explaining a robust sociocultural phenomenon like religion.

**imitative feature in biology:** *The Myth of Mirror Neurons: The Real Neuroscience of Communication and Cognition* Gregory Hickok, 2014-08-18 An essential reconsideration of one of the most far-reaching theories in modern neuroscience and psychology. In 1992, a group of neuroscientists from Parma, Italy, reported a new class of brain cells discovered in the motor cortex of the macaque monkey. These cells, later dubbed mirror neurons, responded equally well during the monkey’s own motor actions, such as grabbing an object, and while the monkey watched someone else perform similar motor actions. Researchers speculated that the neurons allowed the monkey to understand others by simulating their actions in its own brain. Mirror neurons soon jumped species and took human neuroscience and psychology by storm. In the late 1990s theorists showed how the cells provided an elegantly simple new way to explain the evolution of language, the development of human empathy, and the neural foundation of autism. In the years that followed, a

stream of scientific studies implicated mirror neurons in everything from schizophrenia and drug abuse to sexual orientation and contagious yawning. In The Myth of Mirror Neurons, neuroscientist Gregory Hickok reexamines the mirror neuron story and finds that it is built on a tenuous foundation—a pair of codependent assumptions about mirror neuron activity and human understanding. Drawing on a broad range of observations from work on animal behavior, modern neuroimaging, neurological disorders, and more, Hickok argues that the foundational assumptions fall flat in light of the facts. He then explores alternative explanations of mirror neuron function while illuminating crucial questions about human cognition and brain function: Why do humans imitate so prodigiously? How different are the left and right hemispheres of the brain? Why do we have two visual systems? Do we need to be able to talk to understand speech? What's going wrong in autism? Can humans read minds? The Myth of Mirror Neurons not only delivers an instructive tale about the course of scientific progress—from discovery to theory to revision—but also provides deep insights into the organization and function of the human brain and the nature of communication and cognition.

**imitative feature in biology:** *Fundamentals of Evolutionary Game Theory and its Applications* Jun Tanimoto, 2015-10-23 This book both summarizes the basic theory of evolutionary games and explains their developing applications, giving special attention to the 2-player, 2-strategy game. This game, usually termed a 2×2 game" in the jargon, has been deemed most important because it makes it possible to posit an archetype framework that can be extended to various applications for engineering, the social sciences, and even pure science fields spanning theoretical biology, physics, economics, politics, and information science. The 2×2 game is in fact one of the hottest issues in the field of statistical physics. The book first shows how the fundamental theory of the 2×2 game, based on so-called replicator dynamics, highlights its potential relation with nonlinear dynamical systems. This analytical approach implies that there is a gap between theoretical and reality-based prognoses observed in social systems of humans as well as in those of animal species. The book explains that this perceived gap is the result of an underlying reciprocity mechanism called social viscosity. As a second major point, the book puts a sharp focus on network reciprocity, one of the five fundamental mechanisms for adding social viscosity to a system and one that has been a great concern for study by statistical physicists in the past decade. The book explains how network reciprocity works for emerging cooperation, and readers can clearly understand the existence of substantial mechanics when the term network reciprocity is used. In the latter part of the book, readers will find several interesting examples in which evolutionary game theory is applied. One such example is traffic flow analysis. Traffic flow is one of the subjects that fluid dynamics can deal with, although flowing objects do not comprise a pure fluid but, rather, are a set of many particles. Applying the framework of evolutionary games to realistic traffic flows, the book reveals that social dilemma structures lie behind traffic flow.

**imitative feature in biology: Social Learning** Thomas R. Zentall, B. G. Galef, Jr., 2013-12-16 First published in 1988. During the past decade there has been a marked increase in the number of North American and European laboratories engaged in the study of social learning. As a consequence, evidence is rapidly accumulating that in animals, as in humans, social interaction plays an important role in facilitating development of adaptive patterns of behavior. Experimenters are isolated both by the phenomena they study and by the species with which they work. The process of creating a coherent field out of the diversity of current social learning research is likely to be both long and difficult. It the authors' hope, that the present volume may prove a useful first step in bringing order to a diverse field.

**imitative feature in biology:** Music as Biology Dale Purves, 2017-02-01 The universality of musical tones has long fascinated philosophers, scientists, musicians, and ordinary listeners. Why do human beings worldwide find some tone combinations consonant and others dissonant? Why do we make music using only a small number of scales out of the billions that are possible? Why do differently organized scales elicit different emotions? Why are there so few notes in scales? In Music as Biology, Dale Purves argues that biology offers answers to these and other questions on which

conventional music theory is silent. When people and animals vocalize, they generate tonal sounds—periodic pressure changes at the ear which, when combined, can be heard as melodies and harmonies. Human beings have evolved a sense of tonality, Purves explains, because of the behavioral advantages that arise from recognizing and attending to human voices. The result is subjective responses to tone combinations that are best understood in terms of their contribution to biological success over evolutionary and individual history. Purves summarizes evidence that the intervals defining Western and other scales are those with the greatest collective similarity to the human voice; that major and minor scales are heard as happy or sad because they mimic the subdued and excited speech of these emotional states; and that the character of a culture's speech influences the tonal palette of its traditional music. Rethinking music theory in biological terms offers a new approach to centuries-long debates about the organization and impact of music.

**imitative feature in biology:** The Laws of Imitation - Scholar's Choice Edition Gabriel De Tarde, Elsie Worthington Clews Parsons, 2015-02-08 This work has been selected by scholars as being culturally important, and is part of the knowledge base of civilization as we know it. This work was reproduced from the original artifact, and remains as true to the original work as possible. Therefore, you will see the original copyright references, library stamps (as most of these works have been housed in our most important libraries around the world), and other notations in the work. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work.As a reproduction of a historical artifact, this work may contain missing or blurred pages, poor pictures, errant marks, etc. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

**imitative feature in biology:** *Perspectives on Imitation: Imitation, human development, and culture* Susan L. Hurley, Nick Chater, 2005 A state-of-the-art view of imitation from leading researchers in neuroscience and brain imaging, animal and developmental psychology, primatology, ethology, philosophy, anthropology, media studies, economics, sociology, education, and law.

**imitative feature in biology:** Aristotle's Philosophy of Biology James G. Lennox, 2001 In addition to being one of the world's most influential philosophers, Aristotle can also be credited with the creation of both the science of biology and the philosophy of biology. He was the first thinker to treat the investigations of the living world as a distinct inquiry with its own special concepts and principles. This book focuses on a seminal event in the history of biology - Aristotle's delineation of a special branch of theoretical knowledge devoted to the systematic investigation of animals. Aristotle approached the creation of zoology with the tools of subtle and systematic philosophies of nature and of science that were then carefully tailored to the investigation of animals. The papers collected in this 2001 volume, written by a pre-eminent figure in the field of Aristotle's philosophy and biology, examine Aristotle's approach to biological inquiry and explanation, his concepts of matter, form and kind, and his teleology.

**imitative feature in biology: A Troublesome Inheritance** Nicholas Wade, 2014-05-06 Drawing on startling new evidence from the mapping of the genome, an explosive new account of the genetic basis of race and its role in the human story Fewer ideas have been more toxic or harmful than the idea of the biological reality of race, and with it the idea that humans of different races are biologically different from one another. For this understandable reason, the idea has been banished from polite academic conversation. Arguing that race is more than just a social construct can get a scholar run out of town, or at least off campus, on a rail. Human evolution, the consensus view insists, ended in prehistory. Inconveniently, as Nicholas Wade argues in A Troublesome Inheritance, the consensus view cannot be right. And in fact, we know that populations have changed in the past few thousand years—to be lactose tolerant, for example, and to survive at high altitudes. Race is not a bright-line distinction; by definition it means that the more human populations are kept apart, the more they evolve their own distinct traits under the selective

pressure known as Darwinian evolution. For many thousands of years, most human populations stayed where they were and grew distinct, not just in outward appearance but in deeper senses as well. Wade, the longtime journalist covering genetic advances for The New York Times, draws widely on the work of scientists who have made crucial breakthroughs in establishing the reality of recent human evolution. The most provocative claims in this book involve the genetic basis of human social habits. What we might call middle-class social traits—thrift, docility, nonviolence—have been slowly but surely inculcated genetically within agrarian societies, Wade argues. These “values” obviously had a strong cultural component, but Wade points to evidence that agrarian societies evolved away from hunter-gatherer societies in some crucial respects. Also controversial are his findings regarding the genetic basis of traits we associate with intelligence, such as literacy and numeracy, in certain ethnic populations, including the Chinese and Ashkenazi Jews. Wade believes deeply in the fundamental equality of all human peoples. He also believes that science is best served by pursuing the truth without fear, and if his mission to arrive at a coherent summa of what the new genetic science does and does not tell us about race and human history leads straight into a minefield, then so be it. This will not be the last word on the subject, but it will begin a powerful and overdue conversation.

**imitative feature in biology:** *Evolutionary Game Theory* Jörgen W. Weibull, 1997 Introduces current evolutionary game theory--where ideas from evolutionary biology and rationalistic economics meet--emphasizing the links between static and dynamic approaches and noncooperative game theory. This text introduces current evolutionary game theory--where ideas from evolutionary biology and rationalistic economics meet--emphasizing the links between static and dynamic approaches and noncooperative game theory. Much of the text is devoted to the key concepts of evolutionary stability and replicator dynamics. The former highlights the role of mutations and the latter the mechanisms of selection. Moreover, set-valued static and dynamic stability concepts, as well as processes of social evolution, are discussed. Separate background chapters are devoted to noncooperative game theory and the theory of ordinary differential equations. There are examples throughout as well as individual chapter summaries. Because evolutionary game theory is a fast-moving field that is itself branching out and rapidly evolving, Jörgen Weibull has judiciously focused on clarifying and explaining core elements of the theory in an up-to-date, comprehensive, and self-contained treatment. The result is a text for second-year graduate students in economic theory, other social sciences, and evolutionary biology. The book goes beyond filling the gap between texts by Maynard-Smith and Hofbauer and Sigmund that are currently being used in the field. Evolutionary Game Theory will also serve as an introduction for those embarking on research in this area as well as a reference for those already familiar with the field. Weibull provides an overview of the developments that have taken place in this branch of game theory, discusses the mathematical tools needed to understand the area, describes both the motivation and intuition for the concepts involved, and explains why and how it is relevant to economics.

**imitative feature in biology: Congenital Anomalies of the Kidney and Urinary Tract** Amin J. Barakat, H. Gil Rushton, 2016-06-08 This comprehensive, easy to read reference addresses the clinical implications of congenital anomalies of the kidney and urinary tract (CAKUT) in children. Authored by a panel of internationally recognized pediatric nephrologists and urologists, chapters discuss clinical presentation, workup, interpretation of imaging studies, genetics, prenatal diagnosis, prevention and treatment of various anomalies to help the practitioner understand, diagnose and manage CAKUT. Tables, figures, algorithms and an extensive appendix listing conditions and syndromes associated with CAKUT are featured to assist physicians in the differential diagnosis and workup of different conditions.

**imitative feature in biology: Origins, Imitation, Conventions** James S. Ackerman, 2002-03-29 Twelve studies by eminent art historian James S. Ackerman. This collection contains studies written by art historian James Ackerman over the past decade. Whereas Ackerman's earlier work assumed a development of the arts as they responded to social, economic, political, and cultural change, his recent work reflects the poststructural critique of the presumption of progress

that characterized Renaissance and modernist history and criticism. In this book he explores the tension between the authority of the past—which may act not only as a restraint but as a challenge and stimulus—and the potentially liberating gift of invention. He examines the ways in which artists and writers on art have related to ancestors and to established modes of representation, as well as to contemporary experiences. The origins studied here include the earliest art history and criticism; the beginnings of architectural drawing in the Middle Ages and Renaissance; Leonardo Da Vinci's sketches for churches, the first in the Renaissance to propose supporting domes on sculpted walls and piers; and the first architectural photographs. Imitation refers to artistic achievements that in part depended on the imitation of forms established in practices outside the fine arts, such as ancient Roman rhetoric and print media. Conventions, like language, facilitate communication between the artist and viewer, but are both more universal (understood across cultures) and more fixed (resisting variation that might diminish their clarity). The three categories are closely linked throughout the book, as most acts of representation partake to some degree of all three.

**imitative feature in biology: The World of Words** Margaret Ann Richek, 1996

**imitative feature in biology:** Mimesis Valery Podoroga, 2024-07-02 The Russian Revolution was a literary as well as political upheaval. With a focus on the revolutionary works of Andrei Platonov and the futurist collective Oberiu, leading Russian literary thinker Valery Podoroga shows how profoundly the Soviet experiment overturned the traditional expectations of fiction and poetry. The production of this groundbreaking new work was inextricably interwoven with the political and historical debates of the time. This volume expands on Podoroga's critical exploration of the analytic anthropology of literature. Here he delves into the ways literature can be used in 'world-building', both in terms of what happens inside the narrative and how it reflects the external world. He explores the function of the work outside of its time: both as a means to project itself into the future and as a document of a former age. How are we to read the past through these works of the imagination? With an introductory essay from the author's daughter, Ioulia Podoroga.

**imitative feature in biology:** Bird Species Dieter Thomas Tietze, 2018-11-19 The average person can name more bird species than they think, but do we really know what a bird “species” is? This open access book takes up several fascinating aspects of bird life to elucidate this basic concept in biology. From genetic and physiological basics to the phenomena of bird song and bird migration, it analyzes various interactions of birds – with their environment and other birds. Lastly, it shows imminent threats to birds in the Anthropocene, the era of global human impact. Although it seemed to be easy to define bird species, the advent of modern methods has challenged species definition and led to a multidisciplinary approach to classifying birds. One outstanding new toolbox comes with the more and more reasonably priced acquisition of whole-genome sequences that allow causative analyses of how bird species diversify. Speciation has reached a final stage when daughter species are reproductively isolated, but this stage is not easily detectable from the phenotype we observe. Culturally transmitted traits such as bird song seem to speed up speciation processes, while another behavioral trait, migration, helps birds to find food resources, and also coincides with higher chances of reaching new, inhabitable areas. In general, distribution is a major key to understanding speciation in birds. Examples of ecological speciation can be found in birds, and the constant interaction of birds with their biotic environment also contributes to evolutionary changes. In the Anthropocene, birds are confronted with rapid changes that are highly threatening for some species. Climate change forces birds to move their ranges, but may also disrupt well-established interactions between climate, vegetation, and food sources. This book brings together various disciplines involved in observing bird species come into existence, modify, and vanish. It is a rich resource for bird enthusiasts who want to understand various processes at the cutting edge of current research in more detail. At the same time it offers students the opportunity to see primarily unconnected, but booming big-data approaches such as genomics and biogeography meet in a topic of broad interest. Lastly, the book enables conservationists to better understand the uncertainties surrounding “species” as entities of protection.

**imitative feature in biology: Speechreading by Humans and Machines** David G. Stork,

Marcus E. Hennecke, 1996-09-01 This book is one outcome of the NATO Advanced Studies Institute (ASI) Workshop, Speechreading by Man and Machine, held at the Chateau de Bonas, Castera-Verduzan (near Auch, France) from August 28 to Septem ber 8, 1995 - the first interdisciplinary meeting devoted the subject of speechreading (lipreading). The forty-five attendees from twelve countries covered the gamut of speechreading research, from brain scans of humans processing bi-modal stimuli, to psychophysical experiments and illusions, to statistics of comprehension by the normal and deaf communities, to models of human perception, to computer vision and learning algorithms and hardware for automated speechreading machines. The first week focussed on speechreading by humans, the second week by machines, a general organization that is preserved in this volume. After the in evitable difficulties in clarifying language and terminology across disciplines as diverse as human neurophysiology, audiology, psychology, electrical en gineering, mathematics, and computer science, the participants engaged in lively discussion and debate. We think it is fair to say that there was an atmosphere of excitement and optimism for a field that is both fascinating and potentially lucrative. Of the many general results that can be taken from the workshop, two of the key ones are these: • The ways in which humans employ visual image for speech recogni tion are manifold and complex, and depend upon the talker-perceiver pair, severity and age of onset of any hearing loss, whether the topic of conversation is known or unknown, the level of noise, and so forth.

**imitative feature in biology: Darwin's Unfinished Symphony** Kevin N. Lala, 2018-09-11 Humans possess an extraordinary capacity for culture, from the arts and language to science and technology. But how did the human mind—and the uniquely human ability to devise and transmit culture—evolve from its roots in animal behavior? Darwin’s Unfinished Symphony presents a captivating new theory of human cognitive evolution. This compelling and accessible book reveals how culture is not just the magnificent end product of an evolutionary process that produced a species unlike all others—it is also the key driving force behind that process. Kevin N. Lala tells the story of the painstaking fieldwork, the key experiments, the false leads, and the stunning scientific breakthroughs that led to this new understanding of how culture transformed human evolution. It is the story of how Darwin’s intellectual descendants picked up where he left off and took up the challenge of providing a scientific account of the evolution of the human mind.

**imitative feature in biology: The Japanese Economy** Mitsuo Sait?, 2000 This is an introduction to the Japanese economy. The general feature of the Japanese economy, together with its historical and geographical background, is first described. Its famous rapid economic growth in the 1960s are then analyzed quantitatively in the light of the econometric findings. The facts on the saving ratio, trade balances, technical progress, industrial structure, business cycles, economic development and so on are presented, and their relation to the economic performance are discussed. The elementary economic concepts and theories are also explained with illustrations from the Japanese economy, so that the book may be easily accessible to the general readers. The readers of the book will acquire a bird's-eye view of the Japanese economy and the theoretical elucidation of its special features.

**imitative feature in biology:** *The Mirror Neuron System* Christian Keysers, Luciano Fadiga, 2016-06 Mirror neurons are premotor neurons, originally discovered in the macaque brain , that discharge both during execution of goal-directed actions and during the observation of similar actions executed by another individual. They therefore ¿mirror¿ others¿ actions on the observer's motor repertoire. In the last decade an impressive amount of work has been devoted to the study of their properties and to investigate if they are present also in our species. Neuroimaging and electrophysiological techniques have shown that a mirror-neuron system does exist in the human brain as well. Among ¿mirror¿ human areas, Broca¿s area (the frontal area for speech production) is almost constantly activated by action observation. This suggests a possible evolutionary link between action understanding and verbal communication. In the most recent years, mirror-like phenomena have been demonstrated also for domains others than the pure motor one. Examples of that are the somatosensory and the emotional systems, possibly providing a neurophysiological basis

to phenomena such as embodiment and empathy. This special issue collects some of the most representative works on the mirror-neuron system to give a panoramic view on current research and to stimulate new experiments in this exciting field.

**imitative feature in biology:** *Intersubjective Communication and Emotion in Early Ontogeny* Stein Bråten, 1998 The concept of intersubjectivity, explicit or implicit, has emerged as a common denominator in approaches to interpersonal engagements in early infancy and children's understanding of others' thought and emotion. This 1999 book brings together the most senior international figures in psychology, psychopathology, sociology and primatology to address the key question of the role of intersubjectivity in early ontogeny. Together, they offer an interesting perspective on child development, learning and communication and highlight important comparisons with processes in autistic development and in infant ape development. The book is divided into four parts, focusing on intersubjective attunement in human infancy; companionship and emotional responsiveness in early childhood; imitation, emotion and understanding in primate communication; and intersubjective attunement and emotion in language learning and language use. It is an invaluable resource for researchers in emotion and communication across the social and behavioural sciences.

**imitative feature in biology:** The Play of Man Karl Groos, 1908

**imitative feature in biology: Developmental Education for Young Children** Bert van Oers, 2012-06-16 Developmental Education is an approach to education in school that aims at promoting children’s cultural development and their abilities to participate autonomously and well-informed in the cultural practices of their community. From the point of view of Cultural-historical Activity theory (CHAT), a play-based curriculum has been developed over the past decades for primary school, which presents activity contexts for pupils in the classroom that create learning and teaching opportunities for helping pupils with appropriating cultural knowledge, skills, and moral understandings in meaningful ways. The approach is implemented in numerous Dutch primary schools classrooms with the explicit intention to support the learning of both pupils and teachers. The book focuses especially on education of young children (4 – 8 years old) in primary school and presents the underpinning concepts of this approach, and chapters on examples of good practices in a variety of subject matter areas, such as literacy (vocabulary acquisition, reading, writing), mathematics, and arts. Successful implementation of Developmental Education in the classroom strongly depends on dynamic assessment and continuous observations of young pupils’ development. Strategies for implementation of both the teaching practices and assessment strategies are discussed in detail in the book.

**imitative feature in biology: Biology and Its Makers** William Albert Locy, 1915

**imitative feature in biology:** Epigenetic Inheritance and Evolution Eva Jablonka, Marion J. Lamb, 1995 Does the inheritance of acquired characteristics play a significant role in evolution? In this book, Eva Jablonka and Marion J. Lamb attempt to answer that question with an original, provocative exploration of the nature and origin of hereditary variations. Starting with a historical account of Lamarck's ideas and the reasons they have fallen in disrepute, the authors go on to challenge the prevailing assumption that all heritable variation is random and the result of variation in DNA base sequences. They also detail recent breakthroughs in our understanding of the molecular mechanisms underlying inheritance--including several pathways not envisioned by classical population genetics--and argue that these advances need to be more fully incorporated into mainstream evolutionary theory. Throughout, the book offers a new look at the evidence for and against the hereditability of environmentally induced changes, and addresses timely questions about the importance of non-Mendelian inheritance. A glossary and extensive list of references round out the book. Urging a reconsideration of the present DNA-centric view prevalent in the field, Epigentic Inheritance and Evolution will make fascinating and important reading for students and researchers in evolution, genetics, ecology, molecular biology, developmental biology, and the history and philosophy of science.

IMITATIVE Definition & Meaning - Merriam-Webster
The meaning of IMITATIVE is marked by imitation. How to use imitative in a sentence.

**IMITATIVE | English meaning - Cambridge Dictionary**
imitative of All these magazines are imitative of each other. He's an imitative artist, with very little originality in his work.

IMITATIVE Definition & Meaning | Dictionary.com
Imitative definition: imitating; copying; given to imitation.. See examples of IMITATIVE used in a sentence.

**Imitative - Definition, Meaning & Synonyms | Vocabulary.com**
Definitions of imitative adjective marked by or given to imitation “acting is an imitative art” “man is an imitative being” synonyms: apelike, apish

**IMITATIVE definition and meaning | Collins English Dictionary**
People and animals who are imitative copy others' behaviour. Babies of eight to twelve months are generally highly imitative.

*Imitative - definition of imitative by The Free Dictionary*
imitative ('ɪmɪtətɪv) adj 1. imitating or tending to imitate or copy 2. characterized by imitation

**imitative adjective - Definition, pictures, pronunciation and usage ...**
Definition of imitative adjective in Oxford Advanced Learner's Dictionary. Meaning, pronunciation, picture, example sentences, grammar, usage notes, synonyms and more.

**imitative - Wiktionary, the free dictionary**
Aug 11, 2025 · imitative (comparative more imitative, superlative most imitative) Imitating; copying; not original. Modelled after another thing. (linguistics) sound-symbolic or onomatopoeic

IMITATIVE Synonyms: 85 Similar and Opposite Words - Merriam-Webster
Synonyms for IMITATIVE: imitation, emulative, mimetic, formulaic, mock, mimic, unoriginal, copied; Antonyms of IMITATIVE: original, true, authentic, legitimate, natural, real, archetypal, ...

**imitative, adj. & n. meanings, etymology and more | Oxford ...**
There are five meanings listed in OED's entry for the word imitative, one of which is labelled obsolete. See ‘Meaning & use’ for definitions, usage, and quotation evidence.

**IMITATIVE Definition & Meaning - Merriam-Webster**
The meaning of IMITATIVE is marked by imitation. How to use imitative in a sentence.

IMITATIVE | English meaning - Cambridge Dictionary
imitative of All these magazines are imitative of each other. He's an imitative artist, with very little originality in his work.

**IMITATIVE Definition & Meaning | Dictionary.com**
Imitative definition: imitating; copying; given to imitation.. See examples of IMITATIVE used in a sentence.

Imitative - Definition, Meaning & Synonyms | Vocabulary.com
Definitions of imitative adjective marked by or given to imitation “acting is an imitative art” “man is

an imitative being” synonyms: apelike, apish

**IMITATIVE definition and meaning | Collins English Dictionary**
People and animals who are imitative copy others' behaviour. Babies of eight to twelve months are generally highly imitative.

**Imitative - definition of imitative by The Free Dictionary**
imitative ('ɪmɪtətɪv) adj 1. imitating or tending to imitate or copy 2. characterized by imitation

*imitative adjective - Definition, pictures, pronunciation and usage ...*
Definition of imitative adjective in Oxford Advanced Learner's Dictionary. Meaning, pronunciation, picture, example sentences, grammar, usage notes, synonyms and more.

imitative - Wiktionary, the free dictionary
Aug 11, 2025 · imitative (comparative more imitative, superlative most imitative) Imitating; copying; not original. Modelled after another thing. (linguistics) sound-symbolic or onomatopoeic

IMITATIVE Synonyms: 85 Similar and Opposite Words - Merriam-Webster
Synonyms for IMITATIVE: imitation, emulative, mimetic, formulaic, mock, mimic, unoriginal, copied; Antonyms of IMITATIVE: original, true, authentic, legitimate, natural, real, archetypal, …

imitative, adj. & n. meanings, etymology and more | Oxford ...
There are five meanings listed in OED's entry for the word imitative, one of which is labelled obsolete. See ‘Meaning & use’ for definitions, usage, and quotation evidence.

Back to Home