

Snakes Ignite Instinctive Fear Response in Primates

Description

Monkeys, [much like humans](#), possess an intrinsic capability to swiftly identify snakes, and recent research indicates that scales constitute a vital visual cue for primates when discerning these serpentine threats.

Cognitive scientist Nobuyuki Kawai from Nagoya University, Japan, conducted experiments involving three [Japanese macaques](#) (*Macaca fuscata*), which had no prior exposure to live reptiles or amphibians, having only encountered images of snakes in earlier studies. Predictably, the animals exhibited a significantly quicker response to images of [snakes](#) in contrast to [salamanders](#) within a reward-based identification task.

Remarkably, when the salamander images were augmented with a snakeskin overlay, the monkeys' response times equaled those observed with actual snake images. This suggests that scaly textures serve as a crucial visual stimulus for recognition.

Animal pictures Image type unknown

The researcher utilized grayscale images of salamanders (left), snakes (middle), and salamanders overlaid with snakeskin (right). (Kawai, *Scientific Reports*, 2024)

"While we previously demonstrated that both humans and primates can quickly recognize snakes, the specific critical visual features had yet to be discerned," [remarks](#) Kawai.

Notably, the monkeys did not register a heightened response to salamanders, a species sharing a similar elongated morphology with snakes, until the images were modified to feature snakeskin. This lends credence to the hypothesis that primates might have evolved a specialized visual acuity for identifying snakes, informed by their evolutionary history.

These findings suggest that the capacity to recognize snakes is of paramount importance, as evidenced by the fact that snakes pose a considerable threat to humans, responsible for approximately 94,000 fatalities annually, starkly contrasting the mere 14 fatalities attributed to shark attacks in 2023.

Vocabulary List:

1. **Intrinsic** /ɪnˈtrɪn.zɪk/ (adjective): Belonging naturally; essential.
2. **Discern** /dɪˈsɜːn/ (verb): To perceive or recognize something.
3. **Augmented** /ɔːɡˈmen.tɪd/ (verb): Made greater by adding to it.
4. **Acquity** /əˈkwɪt.i/ (noun): Sharpness or keenness of thought vision or hearing.
5. **Vital** /ˈvaɪ.təl/ (adjective): Absolutely necessary; essential.
6. **Mortality** /mɔːrˈtæl.i.ti/ (noun): The state of being subject to death.



Comprehension Questions

Multiple Choice

1. What vital visual cue do recent research indicate is important for primates when discerning snakes?
Option: Color patterns
Option: Scales
Option: Tail length
Option: Eye color
2. In experiments with Japanese macaques, what did the monkeys exhibit a quicker response to in a reward-based identification task?
Option: Images of birds
Option: Images of flowers
Option: Images of snakes
Option: Images of fish
3. What did the response times of the monkeys equal when salamander images were augmented with a snakeskin overlay?
Option: Response times to birds
Option: Response times to flowers
Option: Actual snake images
Option: Images of sharks
4. What did the researcher utilize to modify the salamander images to feature snakeskin?
Option: Feathers
Option: Leaves
Option: Fur
Option: Snakeskin overlay
5. What did the monkeys register a heightened response to after the images were modified to feature snakeskin?
Option: Birds
Option: Flowers
Option: Salamanders
Option: Fish



6. What led to the hypothesis that primates might have evolved a specialized visual acuity for identifying snakes?

- Option: Their diet
- Option: Their habitat
- Option: Their evolutionary history
- Option: Their social behavior

True-False

- 7. Monkeys cannot quickly identify snakes like humans can.
- 8. Japanese macaques had prior exposure to live reptiles or amphibians before the experiments.
- 9. Salamander images modified with snakeskin overlay did not affect the monkeys' response times.
- 10. Snakes pose less of a threat to humans compared to shark attacks.
- 11. Primates do not share any visual similarities with snakes.
- 12. The capacity to recognize snakes is deemed unimportant in the study.

Gap-Fill

- 13. The monkeys exhibited a quicker response to images of snakes compared to _____ within a reward-based identification task.
- 14. The monkeys did not register a heightened response to _____ until the images were modified to feature snakeskin.
- 15. The response times of the monkeys equaled those observed with actual snake images when the salamander images were augmented with a snakeskin _____.
- 16. These findings suggest that the capacity to recognize snakes is of paramount importance, as evidenced by the fact that snakes pose a considerable threat to humans, responsible for approximately 94,000 fatalities annually, starkly contrasting the mere 14 fatalities attributed to _____ attacks



in 2023.

17. Monkeys, much like humans, possess an intrinsic capability to swiftly identify _____.

18. Cognitive scientist Nobuyuki Kawai conducted experiments involving three _____
macaques.

Answer

Multiple Choice: 1. Scales 2. Images of snakes 3. Actual snake images 4. Snakeskin overlay 5. Salamanders
6. Their evolutionary history

True-False: 7. False 8. False 9. False 10. True 11. False 12. False

Gap-Fill: 13. salamanders 15. overlay 16. shark 17. snakes 18. Japanese

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. What term is used to describe something that has been explained in a clear and detailed manner?

Option: Absorption

Option: Degeneration

Option: Elucidated

Option: Therapeutic

2. Which term refers to the origin and development of a disease?

Option: Mitigating

Option: Pathogenesis

Option: Intercellular

Option: Taxonomic

3. Which term means inspiring fear or respect through being impressively large powerful intense or capable?

Option: Formidable

Option: Ecological

Option: Phenotypic

Option: Modulate

4. Which term relates to the healing of a disease or the treatment of a disorder?



- Option: Intrinsic
- Option: Therapeutic
- Option: Delineate
- Option: Antisocial

5. What is the term used to describe a statistical analysis that combines the results of multiple scientific studies?

- Option: Meta-analysis
- Option: Prophylaxis
- Option: Mitigating
- Option: Inherent

6. Which term means to support strengthen or reinforce something?

- Option: Obscured
- Option: Bolster
- Option: Emblematic
- Option: Augmented

7. What term describes a pattern of behavior that is harmful or disruptive to others in society?

- Option: Exquisite
- Option: Antisocial
- Option: Artistry
- Option: Mortality

8. Which term means to regulate adjust or control something?

- Option: Discern
- Option: Modulate
- Option: Acquity
- Option: Vital

9. What term is used to describe something that is not clear or hidden from view?

- Option: Inherent
- Option: Obscured
- Option: Delineate
- Option: Degeneration

10. Which term means to make something greater by adding to it?

- Option: Augmented
- Option: Acquity
- Option: Vital
- Option: Mortality



Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. _____ is the sharpness or keenness of thought vision or hearing.
12. _____ refers to the deterioration or weakening of something especially over time.
13. Proper nutrition is _____ for maintaining good health.
14. Her _____ talent for music became evident at a very young age.
15. The scientist studied the _____ impact of deforestation on local wildlife.
16. The government introduced new policies to reduce infant _____ rates.
17. The study focused on the _____ characteristics displayed by the new species.
18. The artist was able to _____ the intricate details of the landscape in his painting.
19. The hiker was saved by the timely administration of _____ after being bitten by a snake.
20. Regular hand washing is a simple form of _____ against the spread of infectious diseases.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The professor the complex theory to the students in a way that was easy to understand.
22. Communication between cells occurs through signaling molecules.
23. The bald eagle is of strength and freedom in the United States.
24. The researchers conducted a of existing studies to draw comprehensive conclusions.
25. Her talent for storytelling was and had been evident since she was a child.
26. The ability to subtle differences in color is essential for a painter.



27. The chef's culinary was evident in the beautifully presented dishes.
28. Planting more trees is a factor in reducing air pollution.
29. The jewelry was crafted with detail and precision.
30. The scientist carefully outlined the experimental before conducting the research.

Answer

Multiple Choice: 1. Elucidated 2. Pathogenesis 3. Formidable 4. Therapeutic 5. Meta-analysis 6. Bolster 7. Antisocial 8. Modulate 9. Obscured 10. Augmented

Gap-Fill: 11. Acquity 12. Degeneration 13. Vital 14. Intrinsic 15. Ecological 16. Mortality 17. Phenotypic 18. Delineate 19. Antivenom 20. Prophylaxis

Matching sentence: 1. Elucidated 2. Intercellular 3. Emblematic 4. Meta-analysis 5. Inherent 6. Discern 7. Artistry 8. Mitigating 9. Exquisite 10. Methodology

CATEGORY

1. Health - LEVEL6

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