tpo_11_passage_3

Many signals that animals make seem to impose on the signalers costs that are overly damaging. A classic example is noisy begging by nestling songbirds when a parent returns to the nest with food. These loud cheeps and peeps might give the location of the nest away to a listening hawk or raccoon, resulting in the death of the defenseless nestlings. In fact, when tapes of begging tree swallows were played at an artificial swallow nest containing an egg, the egg in that "noisy" nest was taken or destroyed by predators before the egg in a nearby quiet nest in 29 of 37 trials. Further evidence for the costs of begging comes from a study of differences in the begging calls of warbler species that nest on the ground versus those that nest in the relative safety of trees. The young of ground-nesting warblers produce begging cheeps of higher frequencies than do their tree-nesting relatives. These higher-frequency sounds do not travel as far, and so may better conceal the individuals producing them, who are especially vulnerable to predators in their ground nests. David Haskell created artificial nests with clay eggs and placed them on the ground beside a tape recorder that played the begging calls of either tree-nesting or of ground-nesting warblers. The eggs "advertised" by the tree-nesters' begging calls were found bitten significantly more often than the eggs associated with the ground-nesters' calls. The hypothesis that begging calls have evolved properties that reduce their potential for attracting predators yields a prediction: baby birds of species that experience high rates of nest predation should produce softer begging signals of higher frequency than nestlings of other species less often victimized by nest predators. This prediction was supported by data collected in one survey of 24 species from an Arizona forest, more evidence that predator pressure favors the evolution of begging calls that are hard to detect and pinpoint. Given that predators can make it costly to beg for food, what benefit do begging nestlings derive from their communications? One possibility is that a noisy baby bird provides accurate signals of its real hunger and good health, making it worthwhile for the listening parent to give it food in a nest where several other offspring are usually available to be fed. If this hypothesis is true, then it follows that nestlings should adjust the intensity of their signals in relation to the signals produced by their nestmates, who are competing for parental attention. When experimentally deprived baby robins are placed in a nest with normally fed siblings, the hungry nestlings beg more loudly than usual-but so do their better-fed siblings, though not as loudly as the hungrier birds. If parent birds use begging intensity to direct food to healthy offspring capable of vigorous begging, then parents should make food delivery decisions on the basis of their offsprings' calls. Indeed, if you take baby tree swallows out of a nest for an hour feeding half the set and starving the other half, when the birds are replaced in the nest, the starved youngsters beg more loudly than the fed birds, and the parent birds feed the active beggars more than those who beg less vigorously. As these experiments show, begging apparently provides a signal of need that parents use to make judgments about which offspring can benefit most from a feeding. But the question arises, why don't nestlings beg loudly when they aren't all that hungry? By doing so, they could possibly secure more food, which should result in more rapid growth or larger size, either of which is advantageous. The answer lies apparently not in the increased energy costs of exaggerated begging-such energy costs are small relative to the potential gain in calories-but rather in the damage that any successful cheater would do to its siblings, which share genes with one another. An individual's success in propagating his or her genes can be

affected by more than just his or her own personal reproductive success. Because close relatives have many of the same genes, animals that harm their close relatives may in effect be destroying some of their own genes. Therefore, a begging nestling that secures food at the expense of its siblings might actually leave behind fewer copies of its genes overall than it might otherwise.

question 1

The phrase "impose on" in the passage is closest in meaning to

A increase for

B remove from

C place on

D distribute to

question 2

According to paragraph 1, the experiment with tapes of begging tree swallows establishes which of the following?

A Begging by nestling birds can attract the attention of predators to the nest.

B Nest predators attack nests that contain nestlings more frequently than they attack nests that contain only eggs.

C Tapes of begging nestlings attract predators to the nest less frequently than real begging calls do.

D Nest predators have no other means of locating bird nests except the begging calls of nestling birds.

question 3

Paragraph 2 indicates that the begging calls of tree nesting warblers

A put them at more risk than ground-nesting warblers experience

B can be heard from a greater distance than those of ground-nesting warblers

C are more likely to conceal the signaler than those of ground-nesting warblers

D have higher frequencies than those of ground-nesting warblers

question 4

The experiment described in paragraph 2 supports which of the following conclusions?

A Predators are unable to distinguish between the begging cheeps of ground-nesting and those of tree-nesting warblers except by the differing frequencies of the calls.

B When they can find them, predators prefer the eggs of tree-nesting warblers to those of ground-nesting warblers.

C The higher frequencies of the begging cheeps of ground-nesting warblers are an adaptation to the threat that ground-nesting birds face from predators.

D The danger of begging depends more on the frequency of the begging cheep than on how loud it is.

question 5

In paragraphs 4 and 5, what evidence supports the claim that the intensity of nestling begging calls is a good indicator of which offspring in a nest would most benefit from a feeding?

A When placed in a nest with hungry robins, well-fed robins did not beg for food.

B Among robin nestlings, the intensity of begging decreased the more the nestlings were fed.

C Hungry tree swallow nestlings begged louder than well-fed nestlings in the same nest.

D Hungry tree swallow nestlings continued to beg loudly until they were fed whereas well-fed nestlings soon stopped begging.

question 6

It can be inferred from paragraphs 4 and 5 that parent songbirds normally do not feed

A nestlings that are too weak to beg for food as vigorously as their nestmates

B more than one hungry nestling during a single visit to the nest

C offspring that were fed by the parents on the previous visit to the nest

D nestlings that have been removed and then later put back into their nest

question 7

In paragraph 6, the author compares the energy costs of vigorous begging with the potential gain in calories from such begging in order to

A explain why begging for food vigorously can lead to faster growth and increased size

B explain how begging vigorously can increase an individual’ s chance of propagating its own genes

C point out a weakness in a possible explanation for why nestlings do not always beg vigorously

D argue that the benefits of vigorous begging outweigh any possible disadvantages

question 8

According to paragraph 6, which of the following explains the fact that a well-fed nestling does not beg loudly for more food?

A There is no benefit for a nestling to get more food than it needs to survive.

B By begging loudly for food it does not need, a nestling would unnecessarily expose itself to danger from predators.

C If a nestling begs loudly when it is not truly hungry, then when it is truly hungry its own begging may be drowned out by that of its well-fed siblings.

D More of a nestling's genes will be passed to the next generation if its hungry siblings get enough food to survive.

question 9

Look at the four squares [ ] that indicate where the following sentence could be added to the passage. Where would the sentence best fit?

Many signals that animals make seem to impose on the signalers costs that are overly damaging. [] A classic example is noisy begging by nestling songbirds when a parent returns to the nest with food. [] These loud cheeps and peeps might give the location of the nest away to a listening hawk or raccoon, resulting in the death of the defenseless nestlings. [] In fact, when tapes of begging tree swallows were played at an artificial swallow nest containing an egg, the egg in that "noisy" nest was taken or destroyed by predators before the egg in a nearby quiet nest in 29 of 37 trials. [] Further evidence for the costs of begging comes from a study of differences in the begging calls of warbler species that nest on the ground versus those that nest in the relative safety of trees. The young of ground-nesting warblers produce begging cheeps of higher frequencies than do their tree-nesting relatives. These higher-frequency sounds do not travel as far, and so may better conceal the individuals producing them, who are especially vulnerable to predators in their ground nests. David Haskell created artificial nests with clay eggs and placed them on the ground beside a tape recorder that played the begging calls of either tree-nesting or of ground-nesting warblers. The eggs "advertised" by the tree-nesters' begging calls were found bitten significantly more often than the eggs associated with the ground-nesters' calls. The hypothesis that begging calls have evolved properties that reduce their potential for attracting predators yields a prediction: baby birds of species that experience high rates of nest predation should produce softer begging signals of higher frequency than nestlings of other species less often victimized by nest predators. This prediction was supported by data collected in one survey of 24 species from an Arizona forest, more evidence that predator pressure favors the evolution of begging calls that are hard to detect and pinpoint. Given that predators can make it costly to beg for food, what benefit do begging nestlings derive from their communications? One possibility is that a noisy baby bird provides accurate signals of its real hunger and good health, making it worthwhile for the listening parent to give it food in a nest where several other offspring are usually available to be fed. If this hypothesis is true, then it follows that nestlings should adjust the intensity of their signals in relation to the signals produced by their nestmates, who are competing for parental attention. When experimentally deprived baby robins are placed in a nest with normally fed siblings, the hungry nestlings beg more loudly than usual-but so do their better-fed siblings, though not as loudly as the hungrier birds. If parent birds use begging intensity to direct food to healthy offspring capable of vigorous begging, then parents should make food delivery decisions on the basis of their offsprings' calls. Indeed, if you take baby tree swallows out of a nest for an hour feeding half the set and starving the other half, when the birds are replaced in the nest, the starved youngsters beg more loudly than the fed birds, and the parent birds feed the active beggars more than those who beg less vigorously. As these experiments show, begging apparently provides a signal of need that parents use to make judgments about which offspring can benefit most from a feeding. But the question arises, why don't nestlings beg loudly when they aren't all that hungry? By doing so, they could possibly secure more food, which should result in more rapid growth or larger size, either of which is advantageous. The answer lies apparently not in the increased energy costs of exaggerated begging-such energy costs are small relative to the potential gain in calories-but rather in the damage that any successful cheater would do to its siblings, which share genes with one another. An individual's success in propagating his or her genes can be

affected by more than just his or her own personal reproductive success. Because close relatives have many of the same genes, animals that harm their close relatives may in effect be destroying some of their own genes. Therefore, a begging nestling that secures food at the expense of its siblings might actually leave behind fewer copies of its genes overall than it might otherwise.

question 10

Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that not presented in the passage or are minor ideas in the passage. This question is worth 2 points.

A. Songbird species that are especially vulnerable to predators have evolved ways of reducing the dangers associated with begging calls.

B. Songbird parents focus their feeding effort on the nestlings that beg loudest for food.

C. It is genetically disadvantageous for nestlings to behave as if they are really hungry when they are not really hungry.

D. The begging calls of songbird nestlings provide a good example of overly damaging cost to signalers of signaling.

E. The success with which songbird nestlings communicate their hunger to their parents is dependent on the frequencies of the nestlings' begging calls.

F. Songbird nestlings have evolved several different ways to communicate the intensity of their hunger to their parents.