

I. READING COMPREHENSION: 80%

SY MONTGOMERY

CAN ANIMALS TALK?

1 With three hand gestures—each carrying its own meaning—Long Marine Laboratory researcher Ronald Schusterman signals “small ball fetch.” This is old hat for Rocky, a teenage female California sea lion that has been working with Schusterman for more than five years. The sleek marine mammal reliably retrieves the small ball—ignoring the large ball, the small bat and the black Clorox bottle, also afloat in her tank—and brings it directly to the rubber-booted psychologist.

2 But then Schusterman tries a new experiment: He removes the small ball, leaves the large ball in the tank and adds an even larger ball. Again he signals Rocky, “small ball fetch.”

3 Rocky begins to search the tank. Her dog-like head swivels, her liquid eyes scan the water’s surface. She circles. She even searches under water. No doubt about it: The original small ball is not there. Finally, she appears to reach a decision about Schusterman’s odd request: She brings him the smaller of the two balls—the ball that, only minutes before, had been the larger one.

4 Schusterman considers this an exciting finding. It demonstrates that not only does Rocky understand the concept of “small,” she also understands it in both absolute and relative terms. And, he points out, “This kind of classification and categorization is very crucial in the acquisition of language.”

5 In studies here and in Honolulu, psychologists working with marine mammals are documenting language-like abilities that have never been so convincingly demonstrated before.

6 Today, in a radical departure from the bulk of previous language work with apes, these researchers are concentrating on probing the animals’ language comprehension, rather than focusing on use of language. And by probing anew the fundamental nature of language, learning and thinking, they are discovering that humans and marine mammals appear to share remarkable similarities in the ways that they gather, assimilate and make decisions about the information in their world.

7 “I think we’re living at a high point in terms of the study of these phenomena in animals,” Schusterman says. “I think (the observations) enable us to see a powerful connection between ourselves and other animals.” Perhaps, he ventures, most of the cognitive abilities necessary for the comprehension of language are already present in most mammals and birds, contrary to current belief.

8 In the 1960s and ’70s, great apes were the stars of animal-language experiments. Koko, a female lowland gorilla, was tutored in American Sign Language. Her trainer, Penny Patterson, claimed the gorilla used this language to swear, joke, lie and even rhyme. Washoe, a female chimpanzee, used sign language to communicate her perceptions. Raised among humans, when she first saw another chimp and was asked what it was, she signed “black bug.” A language-trained chimp named Lucy used known signs to create novel combinations to describe new objects: She called a watermelon a “candy-drink,” citrus fruits “smell fruits.” The first time she bit into a radish, she named it “hurt-cry food.”

9 But these experiments were heavily criticized, and many were abandoned. As financial support disappeared and the powerful animals grew unmanageable, many of the apes ended up in zoos and medical laboratories.

10 While at times the apes seemed to have clearly understood what they were saying, often the humans could not. Critics pointed out that the apes often created mere “word salads.” The apes could produce words, but how much did they understand about what they were saying? Could they process sentences using the grammatical features of a language?

11 By focusing instead on animals’ understanding of language, the new studies can more carefully examine the thought processes and abilities that underlie language. It was difficult to understand what Koko was thinking when she signed “Please milk please me like drink apple bottle.” But “if you issue a request and the animal carries it out,” points out psychologist Lou Herman, “you can reasonably conclude that the animal understood it.”

12 Child-language researchers have long believed that the ability to understand language and the ability to produce it evolve in the child as separate systems that are later integrated. (In fact, the two systems seem to be controlled by separate areas of the brain, as is indicated by the experience of certain stroke victims. Some, depending on the area of the brain affected, can understand language but not speak it; others can speak it but cannot understand it.)

13 In learning language, comprehension normally precedes and exceeds the actual production of language. And working with language comprehension provides a window into the language-like capabilities in which the animals are more likely to excel.

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- 14 As director of Kewalo Basin Marine Mammal Laboratory in Honolulu, Herman was a pioneer of this approach. Many scientists agree that he has given new scientific credibility to the field of animal-language experiments.
- 15 For his work with dolphins, Herman devised two "dolfinized" artificial languages. One, created for Phoenix, a teenage female, was an acoustic language that referred to objects, actions and modifiers with computer-generated whistles played under water. The other, created for another female, Akeakamai (whose Hawaiian name means "lover of wisdom"), was composed of hand and arm gestures that the dolphin viewed in the air.
- 16 Language, Herman points out, is more than just the mental ability to pair symbols with their referents. There must also be syntactic rules—grammar—to govern how the symbols are used and to dictate their meaning within a sentence. Semantics and syntax are the core attributes by which linguists define human language, separating language from other forms of communication. These features allow us to generate infinite meanings from a finite vocabulary—an ability long believed to be the Rubicon separating humans from animals.
- 17 In both of Herman's languages, the object word always precedes the action word. Modifiers always precede the object modified. In addition, Phoenix was taught a straightforward grammar for the position of direct and indirect objects of a sentence: "Surfboard, take to Frisbee." Akeakamai was taught an inverse grammar: "To Frisbee, surfboard take."
- 18 With these rules and a vocabulary of about 50 "words," Herman has discovered that the dolphins will carry out the commands conveyed in literally thousands of sentences.
- 19 It is clear from the dolphins' performance, he says, that they understand the difference between the request. "To left Frisbee, right surfboard take," and "To right surfboard, left Frisbee take"—even though the two commands are made up of identical words.
- 20 Schusterman, who has obtained the same results with seals and sea lions, says this "tells us the animal is very sensitive to sequence. And we know that sequence is one of the important kinds of abilities in language."
- 21 This shows an ability that was obscured in the ape language experiments, which focused on production. For instance, to request an orange, the chimp Nim would typically signal a grammarless string of words: "Give orange me give eat orange me eat orange give me eat orange give me you."
- 22 Schusterman says he is not ready to call what his animals are doing "language." But then he admits that dolphins, sea lions, and seals "might not consider what we do swimming, until we can swim out 40 miles and stay under for 10 minutes." Herman is more confident. Although he stresses that the animals have not demonstrated the language comprehension abilities of even a young child, he concludes that "dolphins do take account of both the semantic and syntactic components of the sentences they receive when organizing a response."
- 23 Importantly, when known signals are combined in novel ways, the dolphins almost always understand them the very first time—an achievement so complex that linguist Noam Chomsky dubbed this, in humans, a "mysterious ability," central to language.
- 24 The animals spontaneously generalize meanings of symbols to apply beyond the contexts in which they were first taught. For instance, when Rocky was taught the symbol for "black," she could apply the concept of "blackness" to all the black items floating in her tank, and tell them apart from items that were white or gray. Schusterman has found that the seals and sea lions, like Herman's larger brained dolphins, are adept at processing symbols, whether they see them or hear them. Sprouts, a 2-year-old male harbor seal at the Santa Cruz lab, is now carrying out directions presented through "mixed media": Synthesized sounds signify objects, and hand signals represent actions.
- 25 And Herman's dolphins have proved so talented at recognizing and processing symbols that they will even correctly carry out gestural instructions signaled to them on a television screen viewed from an underwater window in their tank. They can understand the symbols even when the image is degraded to show only two moving points of light where the trainer's white-gloved hands would be. Other work by Herman shows that dolphins can correctly report whether an object named by a trainer is present in the dolphin's tank. The dolphin responds by pressing one of two paddles to signal presence or absence.
- 26 Recent studies by Herman and research associate Palmer Morel-Samuels show that the dolphin brain appears to be similar to the human brain, in that complex instructions are processed faster by the left hemisphere, and simpler instructions by the right. Says Morel-Samuels: "Whatever the nature of this hemispheric specialization, it suggests that in the processing of information, humans and dolphins may be more alike than some people believe." ■

國立中央大學八十五學年度轉學生入學試題卷

英美語文學系 二年級

科目：英文閱讀與翻譯

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DETERMINING THE MAIN IDEA AND PURPOSE

Choose the best answer.

1. _____ The main idea of the selection is that (a) researchers studying animals' linguistic ability now focus on their ability to use language; (b) marine mammals' ability to use and understand language is nearly as sophisticated as humans; (c) the marine mammals have the same cognitive abilities and brain structure as humans do; (d) researchers working with marine mammals have discovered that they share remarkable similarities to humans in their ability to understand language and to process information.
2. _____ With respect to the main idea, the author's purpose is (a) to present observations and conclusions based on his own research; (b) to summarize the findings and conclusions from current research; (c) to convince the reader to accept a controversial idea; (d) to explain the differences in research methods used to conduct animal-language experiments.

COMPREHENDING MAIN IDEAS

Choose the correct answer.

3. _____ What makes Rocky, the female California sea lion being studied in Santa Cruz, so remarkable is her ability (a) to distinguish between relative shapes of objects when they are changed; (b) to follow oral instructions; (c) to retrieve balls and Clorox bottles; (d) to respond so positively to praise.
4. _____ According to Ronald Schusterman of the Long Marine Laboratory in Santa Cruz, (a) animals and birds will someday be taught to speak; (b) current research is headed in the wrong direction; (c) cognitive abilities to comprehend language may be present in most mammals and birds; (d) more research needs to be done in the area of language acquisition and production.
5. _____ During the 1960s and 1970s, research with Koko, a female gorilla, and Lucy, a chimpanzee, showed that (a) experiments to teach apes language were a waste of time and money; (b) the apes could successfully be taught to speak, but that there was no point to it; (c) the apes could produce language, but it wasn't clear how much they actually understood; (d) the apes could quickly be taught American Sign Language, which allowed them to communicate with humans.
6. _____ Koko's signing of the sentence "Please milk please me like drink apple bottle" was cited as an example of (a) the confusion about the purpose of the experiments; (b) a "word salad" that the human researchers couldn't understand; (c) Koko's inability to understand what she herself was saying; (d) Koko's remarkable ability to ask for things in sign language.
7. _____ The experiments in Hawaii with dolphins' language ability show that, like humans, dolphins can (a) generate new sentences themselves from their stock of fifty vocabulary words; (b) understand and follow accurately many different oral commands; (c) understand several different languages, both real and artificial; (d) understand the meanings of an infinite number of sentences derived from a finite or limited set of vocabulary words.
8. _____ Research scientists now believe that dolphins, seals, and sea lions (a) can generalize meanings of symbols to apply in new situations; (b) have an inborn language ability that surpasses that of a young human child; (c) possess superior intelligence to that of humans; (d) will eventually provide the key to unlocking the secret of intelligence and language acquisition.

MAKING INFERENCES

For each of these statements write Y(Yes) if the inference is an accurate one, N(No) if the inference is an inaccurate one, or CT(Can't Tell) if you do not have enough information to make an inference.

9. _____ Rocky's ability to distinguish between the relative sizes of objects indicates that she processes information much the same way we do.
10. _____ Koko, Lucy, and Washoe ended up in medical laboratories as research subjects.
11. _____ The author believes that the research done on apes' language abilities in the 1960s and 1970s was a waste of money.
12. _____ Researchers working with dolphins had to invent artificial languages because the dolphins cannot understand spoken commands.

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英美語文學系 二年級

科目：英文閱讀與翻譯

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13. _____ If Phoenix and Akeakamai, the dolphins who know artificial languages, were given the nonsense command, "to right left take Frisbee Surfboard," they would probably be confused and wouldn't know what to do.

ANALYZING ORGANIZATION AND SEEING RELATIONSHIPS

Choose the correct answer.

14. _____ In summarizing the research on animals' language abilities, Montgomery is primarily interested in showing the reader that these experiments and their findings are (a) necessary; (b) fascinating; (c) ridiculous; (d) long overdue.
15. _____ Which method of development is used in the section comprising paragraphs 1-3? (a) steps in a process; (b) contrast; (c) cause and effect; (d) term and a definition; (e) main idea and supporting examples.
16. _____ Look again at the ideas discussed in the first sentence of paragraph 6. What is the relationship implied? (a) cause and effect; (b) steps in a process; (c) comparison—a discussion of similarities; (d) contrast—a discussion of differences.
17. _____ Now look at the ideas discussed in the *second* sentence of paragraph 6. What is the relationship implied? (a) cause and effect; (b) steps in a process; (c) comparison—a discussion of similarities; (d) contrast—a discussion of differences.
18. _____ What does the word "while" mean in the first sentence of paragraph 10? (a) still; (b) during that time; (c) at the same time; (d) although.
19. _____ With respect to the entire selection, the purpose of paragraphs 8-11 is (a) to ridicule early experiments done on animal language; (b) to show the change in direction research in animal language has taken; (c) to show the inherent cruelty of these early experiments; (d) to prove that the great apes have little ability to use or produce language.
20. _____ Paragraph 24 contains the transitional phrase "for instance," indicating that what follows is a (a) a conclusion; (b) a definition; (c) a supporting example; (d) a reason.

II. TRANSLATION 20%

Translate the following paragraph into Chinese.

Indeed, society is far more dedicated to noting evidence in favor of superstition than it is to observing contrary evidence. This prejudice goes a long way toward explaining our superstitious nature. When the survivors of a plane crash are interviewed, some of them inevitably insist that they were saved by prayer. The chances are good that some who did not survive also prayed for all they were worth, but they are now unable to testify about the value of the procedure. Arguing that evidence for superstitions is biased is unlikely to impress believers, who will point to someone who should have died six or seven times in a motorcycle accident but was saved by a good-luck charm to endure the ecstasy of life in a coma. Skeptics might reason that if the charm were going to the trouble of making a miracle, it might have done a better job. But that logic won't disturb the faithful.