Unit 1 Talk to the Hand:

Language might have evolved from gestures

チンパンジーやボノボは、手のジェスチャーによって、豊かなコミュニケーションをはかっています。これらの種族の間では、手の同じジェスチャーが、状況によってまったく違う意味を伝えており、これが人間の言語の獲得にも重要なかかわりをもってきます。

◇ Vocabulary Check ◇

CD 02

1 ～ 8 の単語の意味をa ～ hから選びなさい。

1. ( ) flexibility	a. 多様な
2. ( ) convey	b. 解釈する
3. ( ) capacity	c. 能力
4. ( ) verbal	d. 伝える
5. ( ) interpret	e. 言語による
6. ( ) multiple	f. 融通性
7. ( ) imply	g. 受け継ぐ
8. ( ) inherit	h. 暗示する

◇ Reading ◇

CD 03

Chimpanzees and bonobos can communicate with greater flexibility using hand gestures than they can with facial expressions or vocalizations, new research shows. Their use of hand motions to convey different meanings in different circumstances suggests that gestures may have played an important part in the evolution of language.

Researchers speculate about how prehuman species developed the capacity for complex language. One theory suggests that humans' apelike ancestors first communicated through gestures. Once the neural circuits for gesture-based language had evolved, those same brain areas could have switched over to verbal communication. Indeed, research has shown that modern apes use the same area of the brain to interpret hand signals as humans use to process spoken language.

Working at the Yerkes National Primate Research Center in Atlanta, Frans B.M. de Waal and Amy S. Pollick observed communications among 34 captive chimpanzees and among 13 captive bonobos, also known as pygmy chimpanzees. The researchers logged every hand gesture, facial expression, and vocal cry that one animal directed at another. They also noted the social context—playing, grooming, fighting, eating, and so on—in which each signal occurred.

Individual facial expressions and vocalizations were closely tied to a single context, showing little flexibility in meaning or usage, the scientists found. But the apes could use the same hand gesture in multiple contexts, the team reports online and in an upcoming *Proceedings of the National Academy of Sciences*.

For example, reaching out with an upturned palm while eating appeared to be a request for more food, but in fighting situations, the same gesture signaled a desire for support.

"Gesturing is a stepping-stone toward symbolic communication," in which the form of the signal bears no relation to its meaning, says Pollick, now at the Washington, D.C.—based Association for Psychological Science. Using a gesture to convey a meaning that varies with context implies a capacity to redefine signals. "There isn't such a strict connection between a gesture and an emotional context as there is with [an ape's] scream," Pollick says.

Bonobos and chimpanzees are the two closest evolutionary cousins to people. The human lineage diverged from the bonobo—chimpanzee lineage about 6 million years ago, and the last common ancestor of bonobos and chimps lived about 2.5 million years ago. Any similarities in how the two ape species use hand gestures were probably inherited from that common ancestor, giving scientists a window into the past.

"I think this is the best kind of evidence that you'll find" for how language evolved, comments Susan Goldin-Meadow, who studies human gesture and language at the University of Chicago. Fossils reveal almost nothing about how people's distant ancestors communicated, so scientists can infer the past only by looking at modern humans and other primates, she says.

For example, all apes use hand motions to communicate, but monkeys and other animals don't. And gestures are ubiquitous in human communication. "In every single culture, we gesture as we talk," Goldin-Meadow says.

Scientists don't agree on whether and how gestures influenced the evolution of language. For example, Goldin-Meadow suggests that hand motions could have developed in parallel with vocal sounds rather than coming first.

Notes

Talk to the Hand　握った手の形を顔の表情に見たてて話しかけるという遊びを思い浮かべながら、この「手とのお話し」が重要なコミュニケーションツールだったのですよ、というタイトル。**bonobos**「ボノボ」小型で手足の長いサル。ヒトにもっとも近い類人猿といわれる。別名ピグミーチンパンジー（*l.*14）。**flexibility**（多方面に適応できる）「融通性」**vocalizations**「発声」**speculate about** ～「～を推測する」**prehuman species**「人類出現以前の種」**Once...had evolved,**「ひとたび…進化したならば」**neural circuits**「神経回路」**the same area...as humans use**「人間が使うのと同じ領」**area** は大脳皮質の特定の部位を指し、「領」と訳される。**process**「処理する」**the Yerkes National Primate Research Center**「ヤーキス国立霊長類センター」**captive**「捕獲された」研究用に施設内で「飼われている」という意味。**logged**「記録した」*l.*16 の noted「(記録のため) 書きとめた」も同じような意味。**vocal cry**「叫び声」**grooming**「毛づくろい」**process**「処理する」**reports online and in an upcoming *Proceedings of the National Academy of Sciences***「アメリカ科学アカデミー『紀要』の電子版と次号の冊子版に報告する」**an upturned palm**「手の平を上にした片方の手」**a stepping-stone toward** ～「～に向けての足がかり」**bears no relation to** ～「～と無関係である」**the Washington, D.C.-based Association for Psychological Science**「ワシントン特別区に拠点をおく、科学的心理学会」1988年に発足。**cousins**「兄弟（いとこ）分」つまり同系の種族ということ。**lineage**「種族」**diverged from** ～「～から分かれた」**a window**（比喩的に）「知る機会」**apes ... monkeys** 日本語ではともに「猿」だが、英語では尾のない大型類人猿（chimpanzee, gorilla, orangutan など）をape, 小型で尾をもつものをmonkey と区別する。**ubiquitous**「いたるところに見られる」

◇ Comprehension Check ◇

1. 本文の内容に合わせ、[　　] の中に最も適切なものをA〜Cから選びなさい。

(1) Hand gestures made by chimpanzees may communicate different messages [　　].
- A. according to their intelligence
- B. on a random basis
- C. depending on the context

(2) According to Dr. Pollick, the use of gesturing leads to [　　] communication.
- A. emotional
- B. symbolic
- C. inflexible

(3) Currently, one of the best ways to learn about how early humans communicated is to study [　　].
- A. apes
- B. fossils
- C. monkeys

2. 新たに発見された事実や使われた方法について考え、本文から [　　] の中に適切な語を入れなさい。最初の文字は示してあります。

New Findings

(1) A chimpanzee's hand gesture—reaching out its paw palm-upward, for example—can [c　　] different meaning.

(2) Chimpanzees show more [f　　] in communication when they use gestures than they do when they use vocal sounds or facial expressions.

(3) The fact that a hand signal can contain more than one, context-dependent meaning could show how human language [e　　].

Research Process

(1) Researchers knew that the area of the brain where humans process language is the same as the area where apes [i　　] hand signals.

(2) Observing chimpanzees as they communicated with each other, researchers [l　　] all their facial expressions, cries and hand gestures.

(3) The [m　　] contexts in which the chimpanzees communicated by using the same hand gesture were identified and analyzed.

◇ Special Broadcast ◇

CD 04

テーマに関連して、ニュースキャスターのLarryが、Dr. Adamsにインタビューをする「特別番組」です。空所を適語でうめながら、内容を把握しなさい。

Larry　I've noticed that people use gestures even when the other person cannot see them, for (1)_____ while talking on the phone. Can you comment on that ?

Dr. Adams　That's an interesting observation, isn't it? Since gestures are a form of communication, it is (2)_____ that after some time we tend to make gestures unconsciously. We don't realize we are making gestures, but we keep making them. Moreover, making gestures affects the way we sound when we speak.

Larry　So, the gestures we make are useful, even when unseen?

Dr. Adams　That's right. First, as far as perceived gestures, studies have shown that if someone makes a gesture when they speak, then the other person understands their (3)_____ better. Newer studies have shown that this holds true even when the two people cannot see each other. The reason is that when we make a gesture our voices change. We speak more (4)_____ , or more slowly, or with a different emphasis, for example, when we gesture. As a result, the listener gets the benefit of that added nonverbal information even when they can't see us. For example, if you say "Hello" while keeping a (5)_____ face it will sound a lot different than if you smile while you say it.

Larry　OK, let me try. "Hello"..."Hello." Wow! There is a difference!

Dr. Adams　Yes, it (6)_____ much nicer when you smile, doesn't it?

example	message	quickly	sounds	straight	understandable

◇ Easy Translation ◇

語句を並べ替えて英文を作りなさい。

1. 1匹の動物が別の動物に向ける個々の顔の表情や叫び声は、一般に単一の社会状況と密接に結びついている。
Each facial expression or vocal cry that one animal directs at（a / another / closely tied / is generally / to) single social context.

2. サルのジェスチャーのもつ意味は、それが現われる社会状況に応じて変化しうる。
The meaning of an ape's gesture can vary (in which / it / occurs / with / the social context).