

サマライズ講座（要約英日文法）

第 2 講

1. 要約英日文法適用例

第 1 講に引き続き、例文を用いて各ルールとの対応づけを示す。本講ではルール 5 からルール 7 までを取り上げる。

まずは、第 1 講でも用いた[例文 A]で、これまでの成果も踏まえながら要約文作成プロセスを先に進めよう。

[例文 A]

More **Animals** Seem to Have Some Ability to **Count**

Counting may be innate in many species

*Scientists have been skeptical of claims of mathematical¹² abilities in **animals** ever since the case of Clever Hans about 100 years ago. The horse, which performed arithmetic and other intellectual tasks to delighted European audiences, was in reality simply taking subconscious cues from his trainer. Modern examples, such as Alex the African grey parrot, which could **count** up to six and knew sums and differences, are seen by some as special cases or the product of conditioning.*

*Recent studies, however, have uncovered new instances of a **counting** skill in different*

1 【ルール 6】 同義の表現の繰り返しに注目する

文章中に同じような意味のワード、あるいはフレーズが繰り返し用いられている場合には、その内容が文章中で重要視されている可能性は高い。

この例文中で同義の表現と考えられるのは、mathematical、math、arithmetic、subtracted、substraction、summing。

2 【ルール 7】 同一表現の繰り返しに注目する

文章中に、まったく同じワード、あるいはフレーズが繰り返し用いられている場合、それは文章中で重要なものだと考えられる。

この例文中の重要ワード候補は mathematical、math。

species, suggesting that mathematical abilities could be more fundamental in biology than previously thought. Under certain conditions, monkeys could sometimes outperform college students.

In a study published last summer in the Proceedings of the Royal Society B, Kevin C. Burns of Victoria University of Wellington in New Zealand and his colleagues burrowed holes in fallen logs and stored varying numbers of mealworms (beetle larvae) in these holes in full view of wild New Zealand robins at the Karori Wildlife Sanctuary. Not only did the robins flock first to the holes with the most mealworms, but if Burns tricked them, removing some of the insects when they weren't looking, the robins spent twice as long scouring the hole for the missing mealworms. "They probably have some innate ability to discern between small number's" as three and four, Burns thinks, but they also "use their number sense on a daily basis, and so through trial and error, they can train themselves to identify numbers up to 12."

More recently, in the April issue of the same Royal Society journal, Rosa Rugani of the University of Trento in Italy and her team demonstrated arithmetic in newly hatched chickens. The scientists reared the chicks with five identical objects, and the newborns imprinted on these objects, considering them their parents. But when the scientists subtracted two or three of the original objects and left the remainders behind screens, the chicks went looking for the larger number of objects, sensing that Mom was more like a three and not a two. Rugani also varied the size of the objects to rule out the possibility the chicks were identifying groups based simply on the fact that larger numbers of items take up more space than smaller numbers.

*For the past five years Jessica Cantlon of the University of Rochester has been conducting a series of experiments with rhesus monkeys that shows how their numerical skills can rival those of humans. The monkeys, she found, could choose the lesser of two sets of objects when they were the same in size, shape and color. And when size, shape and color were varied, the monkeys showed no change in accuracy or reaction time. One **animal**, rewarded with Kool-Aid, was 10 to 20 percent less accurate than college students but beat them in reaction time. "The monkey didn't mind missing every once in a while," Cantlon recounts. "It wants to get past the mistake and on to the*

¹ **【ルール 7】 同一表現の繰り返しに注目する**

文章中に、まったく同じワード、あるいはフレーズが繰り返し用いられている場合、それは重要な意味を持つ言葉だと考えられる。

例文中の重要ワード候補は number (あるいは numerical)。

next problem where it can get more Kool-Aid, whereas college students can't shake their worry over guessing wrong.”

Elizabeth Brannon of Duke University has conducted similar experiments with rhesus monkeys, getting them to match the number of sounds they hear to the number of shapes they see, proving they can do math across different senses. She also tested the monkeys' ability to do subtraction by covering a number of objects and then removing some of them. In all cases, the monkeys picked the correct remainder at a rate greater than chance. And although they might not grasp the deeper concept of zero as a number, the monkeys knew it was less than two or one, conclude Brannon and her colleagues in the May Journal of Experimental Psychology: General.

*Although Brannon feels that **animals** do not have a linguistic sense of numbers—they aren't **counting** “one, two, three” in their heads—they can do a rough sort of math by summing sets of objects without actually using numbers, and she believes that ability is innate.* Brannon thinks that it might have evolved from the need for territorial **animals** “to access the different sizes of competing groups and for foraging **animals** to determine whether it is good to stay in one area given the amount of food retrieved versus the amount of time invested.”

Irene Pepperberg of the Massachusetts Institute of Technology, famous for her 30-year work with Alex the parrot, says that even bees can learn to discriminate among small quantities. “So some degree of ‘number sense’ seems to be able to be learned even in invertebrates, and such learning is unlikely without some underlying neural architecture on which it is based,” she remarks.

*Understanding the biological basis of number sense in **animals** could have relevance to people.* According to Brannon, it may suggest to childhood educators that math, usually taught after age four or five, could actually be introduced earlier into the curriculum.

ここまでのプロセスで重要箇所として絞り込んだ成果を日本語に訳したものを示す（もちろん、要約文としては作成途中）。次の第3講では、この文章をもとにして、さらに完成形へと仕上げるプロセスを学習する。

100年ほど前の「賢馬ハンス」以来、科学者は動物に数学の能力があるという主張には懐疑的だ。この馬はヨーロッパの人々の前で算術などの知的作業を実演して大評判になったのだが、実は飼い主の無意識の動きを手がかりにしていた。

ところが最近の研究で、いろいろな動物が数を数えている例が新たにわかり、数学の能力がこれまで考えられていたよりも生物に基本的なものである可能性が示されている。ある条件下では、サルが大学生を上回る能力を示す場合もあるようだ。

ニュージーランドにあるウェリントン大学のバーンズ（Kevin C. Burns）らは、倒木に複数の穴を開け、穴ごとに違う数のゴミムシダマシの幼虫を入れて、野生のニュージーランドコマヒタキという鳥から見えるよう野生生物保護区のなかに置いて観察した結果を昨年夏の *Proceedings of the Royal Society B* 誌に発表した。鳥たちは虫の数が最も多い穴に群がっただけでなく、鳥が目を開いた隙にバーンズが一部の虫を取り除くと、2倍の時間をかけて穴を検分し、いなくなった虫を探した。「この鳥たちはおそらく、小さな数（3とか4）を区別する能力を生まれつき持っているのだろう」とバーンズは考えている。「そうした数の感覚を日常的に使っているので、試行錯誤しながら最終的には12くらいまでの数を識別できるようになる」ともいう。

さらに最近では、ヒヨコが算数の能力を持っていることをイタリアのトレント大学のルガニ（Rosa Rugani）の研究チームが実証し、同誌4月号に報告した。

ロチェスター大学のキャントロン（Jessica Cantlon）は過去5年間の一連の実験で、アカゲザルの計算能力が人間に匹敵しうることを示している。

また、デューク大学のブラノン（Elizabeth Brannon）もアカゲザルを使って実験し、耳で聞いた音の回数と同じ個数のものを、目で見ただけのものなかから選べることを示した。聴覚と視覚という異種感覚にまたがって、数合わせができるわけだ。

ブラノンは、動物は言語的な数感覚は持っていない（頭のなかで「1、2、3」と数えているのではない）が、数字に頼らず物体の集合を寄せ合わせることで大雑把な計算はでき、その能力は生まれつき備わっていると考えている。

30年にわたるオウムのアレックスの研究で知られるマサチューセッツ工科大学のペーパーバーグ（Irene Pepperberg）は、小さな量ならハチでさえ学習によって区別可能になるという。

動物に数感覚をもたらしている生物学的基礎の理解が進めば、幼児教育に関係してくるかもしれない。ブラノンによると、ふつう4〜5歳から教え始める算数を、もっと低年齢から教えられる可能性もあるという。

（参考文献：日経サイエンスウェブサイト 2009年11月号）

第3講に進む前に、別の例文も用いてさらにルールの確認をしておこう。

[例文 B]

The typical Hollywood action hero skirts death for a living. Time and again, scores of bad guys shoot at him from multiple directions but miss by a hair. Cars explode just a fraction of a second too late for the fireball to catch him before he finds cover. And friends come to the rescue just before a villain's knife slits his throat. If any one of those things happened just a little differently, the hero would be *hasta la vista, baby*. Yet even if we have not seen the movie before, something tells us that he will make it to the end in one piece.

In some respects, the story of our universe resembles a Hollywood action movie. Several physicists have argued that a slight change to one of the laws of physics would cause some disaster that would disrupt the normal evolution of the universe and make our existence impossible. For example¹, if the strong nuclear force that binds together atomic nuclei had been slightly stronger or weaker, stars would have forged very little of the carbon and other elements that seem necessary to form planets, let alone life. If the proton were just 0.2 percent heavier than it is, all primordial hydrogen would have decayed almost immediately into neutrons, and no atoms would have formed. The list goes on.

（出典：Scientific American ウェブサイト From the January 2010 Scientific American Magazine）

¹ **【ルール 5】 手掛かりとなるワード（フレーズ）を見つける**

この例では、For example に続けて、その直前で述べた内容を具体的に説明していることが分かる。このような、手掛かりとなる表現（ワードやフレーズ）を見つけて、論理の流れや、内容の重要度を判断する。ここでは、一般的な記述（For example の前）が重要なのか、具体例を挙げること（For example のあと）に意味があるのか、などを考慮し、要約文作成に反映させる。