

Reading Passage 3

You should spend about **20 minutes** on **Questions 27 – 40**, which are based on **Reading Passage 3** on the following pages.

A CHANGE IN OUR DIETS MAY HAVE CHANGED THE WAY WE SPEAK

You might be able to thank agriculture for a rise in the use of "f" and "v" sounds, a controversial new study suggests.

As the saying goes, we are what we eat—but does that aspect of our identity carry over to the languages we speak? In a new study in *Science*, a team of linguists at the University of Zurich uses biomechanics and linguistic evidence to make the case that the rise of agriculture thousands of years ago increased the odds that populations would start to use sounds such as f and v. The idea is that agriculture introduced a range of softer foods into human diets, which altered how humans' teeth and jaws wore down with age in ways that made these sounds slightly easier to produce. "I hope our study will trigger a wider discussion on the fact that at least some aspects of language and speech—and I insist, some—need to be treated as we treat other complex human behaviours: laying between biology and culture" says lead study author Damián Blasi.

If confirmed, the study would be among the first to show that a culturally induced change in human biology altered the arc of global languages. Blasi and his colleagues stress that changes in tooth wear didn't guarantee changes in language, nor did they replace any other forces. Instead, they argue that the shift in tooth wear improved the odds of sounds such as f and v emerging. Some scientists in other fields, such as experts in tooth wear, are open to the idea. "Tooth wear is a common pattern with deep evolutionary roots; it's not specific for humans and hominins but also present in the great apes," University of Zurich paleoanthropologists Marcia Ponce de León and Christoph Zollikofer, who didn't participate in the study, say in a joint email. "Who could have imagined that, after millions of years of evolution, it will have implications for human language diversity?"

But many linguists have defaulted to scepticism, out of a broader concern about tracing differences in languages back to differences in biology—a line of thinking within the field that has led to ethnocentrism or worse. Based on the world's huge variety of tongues and dialects, most linguists now think that we all broadly share the same biological tools and sound-making abilities for spoken languages. "We really need to know that the small average differences observed in studies like this aren't swamped by the ordinary diversity within a community," Adam Albright, a linguist at MIT who wasn't involved with the study, says in an email.

Teeth might feel solidly embedded in the skull and jaw, but as anyone who's worn braces can tell you, teeth can shift and drift in the jawbone quite a bit as people age. Humans are often born with a slight overbite, but as teeth naturally wear down, they tilt to a more vertical orientation. To compensate, the bottom jaw shifts forward so that the top and bottom rows of teeth are in an edge-on-edge alignment.

For much of our species' history, this edge-on-edge configuration was the norm in adulthood, as seen in many prehistoric skulls studied over the last three decades. But when societies adopted new agricultural techniques, such as the cultivation of cereal grains and raising cattle, diets changed. Once porridge, cheese, and other soft foods dominated ancient menus, people's teeth saw less wear, which let more people keep an overbite into adulthood. A more common overbite, the thinking goes, set the stage for sounds such as f and v, which you make by tucking your bottom lips beneath their top teeth. If your top teeth jut out slightly more, it's theoretically easier to make these sounds, which linguists call labiodentals.

When Blasi's team compared language records with data on how different societies acquire food, they found that languages used by modern hunter-gatherer societies use about a quarter of the f sounds that agricultural societies do, suggesting a possible correlation with diet. And when they looked at the vast family of Indo-European languages, they found that the odds of labiodentals popping up were worse than 50 percent until 4,000 to 6,000 years ago. "It is often assumed that the structure and the processes we see in languages today were the same as 10,000 years ago," Blasi said. "Now we have a very strong case to think that there are some global and very frequent linguistic phenomena that are surprisingly recent in times of human history."

The time of labiodentals' rise roughly matches up to when their speakers first started using dairy products and cultivating cereal grains. Blasi's team argues that this is no coincidence. "The landscape of sounds that we have is fundamentally affected by the biology of our speech apparatus," says study co-author Balthasar Bickel. "It's not just cultural evolution."

Although the researchers suggest that overbite and overjet make it easier to produce labiodentals, "that doesn't mean that labiodentals will emerge within all languages", said study co-lead author Steven Moran at the University of Zurich. "It does mean that the probability of producing labiodentals increases slightly over time and that means that some languages are likely to acquire them, but not all languages will." In the future, "we are interested in applying our novel methods to other speech sounds beyond just labiodentals," Moran said. "Nearly half of all known speech sounds are unique to particular languages."

Questions 27 – 32

Do the following statements agree with the views of the writer in **Reading Passage 3**?

In boxes **27 – 32** on your answer sheet, write:

YES	<i>if the statement agrees with the views of the writer</i>
NO	<i>if the statement contradicts the views of the writer</i>
NOT GIVEN	<i>if it is impossible to say what the writer thinks about this</i>

27. The agricultural development several thousand years ago indirectly influenced the way humans make 'f' and 'v' sounds.
28. Blasi's study indicated that tooth wear always affected the diversity of languages that humans have.
29. Blasi's study did not receive much support from many linguists.
30. Before new agricultural techniques were applied, overbite had been a natural feature of human's mouth, especially in adults.
31. It is easier for a person with bigger overbite to make the sounds 'f' and 'v'.
32. Hunters use more "f" and "v" sounds than people working in the field of agriculture.

Questions 33 – 37

Choose the correct letter, **A, B, C or D**.

Write the correct letter in **boxes 33 – 37** on your answer sheet.

33. According to the second paragraph, what does Blasi want to emphasize in his research?

- A. Changes in our language are always caused by the shift in our teeth structure
- B. The emergence of “f” and “v” sounds is made more possible by changes in tooth wear
- C. Apes also had changes in teeth like humans.
- D. It took millions of years for our teeth to change.

34. Linguists remained sceptical about Blasi’s study because _____

- A. they think the study is different from the previous ones.
- B. the study did not focus on ordinary diversity in a community.
- C. people actually speak different languages.
- D. they think people generally have the same abilities to make the sounds of spoken languages.

35. According to the passage, before soft foods were used, human overbite _____

- A. gradually disappeared as people grew up.
- B. helped people create the sounds “f” and “v”.
- C. remained even when people reached adulthood.
- D. made it difficult for people to consume cereal grains.

36. Blasi researched the hunter-gatherer societies in order to _____

- A. Learn how they hunted animals for food.
- B. prove that hunting is less effective than agricultural practices.
- C. prove that regular linguistic phenomena occurred more recently than other people had thought.
- D. state that hunting started 4000 – 6000 years ago.

37. In the final paragraph, what did Steven Moran say about languages?

- A. Changes in diet helped people produce more sounds than just labiodentals.
- B. Half of the languages nowadays share the same sounds.
- C. Some languages will not acquire “f” and “v” sounds.
- D. It is unclear whether “f” and “v” sounds will be more popular in languages.