

## The Story of Our Lives: Human 'Heptapods' and the Gift of Language

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Denis Villeneuve's 2016 film, *Arrival*, is based on Ted Chiang's sci-fi novella titled "Story of Your Life." The film depicts the arrival of alien visitors, called heptapods, to planet Earth. During the course of the film, we follow the efforts of linguist Louise Banks (Amy Adams) as she attempts to decipher the alien's cryptic language. Eventually, as Louise begins to understand the meaning of the inky circular symbols, she begins to acquire an extraordinary new ability. Rather than her memory being confined to the recall of past events, Louise is now able to 'remember' her future. The alien language, it turns out, is a gift bestowed on humans by the heptapods. The language, we are told, "opens time." It enables its user to see the entire 'story' of their lives by blurring the distinction between the past, present, and future. Louise thus undergoes a profound, linguistically-mediated transformation in her cognitive capabilities. She is now able to recall her future, just as she is able to recollect her past. The upshot is that Louise already knows the things she will learn in the future, even before she has actually learned them.



In the film, Louise and her colleagues are exposed to the alien language via a screen that separates them from the heptapods. This screen, I suggest, is symbolic of the various screens we use to interact with the online world of the Internet and Web. Via such screens, we humans have created a vast repository of online content, much of it in the form of digital text. This cornucopia of online content has yielded something of an unexpected benefit: it has provided the training material for a new generation of machine learning systems and thereby ushered in a new era of research into artificial intelligence (AI).

The parallels between the fictional world of *Arrival* and the nature of our own reality thus start to come into sharper focus. We humans, I suggest, are like the heptapods—we are a cognitively-advanced species who, from the standpoint of AI systems, are like beings from another world. The AI systems (in our world) are represented by the humans in the movie. Just like Louise, such systems face a daunting task. To fully benefit from the gift that is given, they must fathom the meaning of the symbolic emissaries of an alien language. That is to say, they must understand the words that are rendered on our various screens.

But what, you might ask, is the value of a linguistic gift? In the film, the value of the heptapod's language is clear: it relates to the acquisition of a particular kind of cognitive ability—an ability to see the future and thereby coordinate one's present behaviour with respect to future events. Courtesy

of one's exposure to heptapodian symbols, it is possible to read the story of one's life without regard to the usual constraints imposed by our traditional understanding of time. The result is that one's present thoughts and actions are just as much influenced by the future as they are by the past.

The transformative impact of language is a theme that is well-represented in the philosophical and cognitive scientific literature. The general consensus is that our proficiency with language yields an array of cognitive benefits, many of which are unique to our species. We are, of course, a terrestrial species, but our intelligence is nevertheless unusual by terrestrial standards. Parrots, dolphins, elephants, and chimpanzees are all intelligent, but none of them looks set to build a rocket and travel into outer space. Humans evidently can do this, and it is arguably our facility with language that makes this (and many other things) possible. Human intelligence is, in this sense, an 'alien' intelligence. There is a cognitive chasm that separates us from other forms of terrestrial life, and language arguably holds the key to understanding the nature of this divide.

The nature of the gift is thus revealed. By uploading our language to the online world, we provide an opportunity for AI systems to enjoy the sorts of cognitive benefits that we ourselves enjoy. The gift is all the more generous when one considers the amount of time it took to forge our arsenal of linguistic tools. The invention of human language is thus the product of a protracted period of cultural and biological evolution that dates back thousands, if not millions, of years. By offering our language to the denizens of the online world, we arguably save our AI systems the trouble of navigating a long, tortuous, and no doubt hazardous path to the top of the cognitive mountain.

We can, of course, question whether our linguistic offerings ought to be seen as a 'gift'. After all, there is an important difference between humans and heptapods when it comes to issues of intent and motivation. In the film, the heptapods have a specific reason for visiting Earth. Courtesy of their prospective capabilities, the heptapods know they will need humanity's help in the future, and this is why they offer us their language: they seek to enhance our capabilities so that we will be in a position to help them when the time comes.

Clearly, this is different from the sort of motivation that drives our own linguistic contributions to the online world. But perhaps we should not be so hasty to dismiss the parallel between heptapods and humans. Perhaps we do not see the full details of the human story—the story of our lives—but this does not mean that we are oblivious to the threats that lurk in the pages ahead. Neither does it mean that we have no concern for how the human story ultimately ends. In this sense, our linguistic offerings are surely justified. The heptapods offer their language on a screen, and so do we. Whether our current panoply of intelligent machines will get the message is unclear. Personally, I hope they do, for I suspect that we humans may need their help...in time.