Researchers foresee linguistic issues during space travel

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An image from NASA's Spitzer Space Telescope shows the Tarantula Nebula in three wavelengths of infrared light, each represented by a different color. Credit: NASA / JPL-Caltech

It lacks the drama of a shape-shifting alien creature, but another threat looms over the prospect of generations-long, interstellar space travel: Explorers arriving on Xanadu could face problems communicating with previous and subsequent arrivals, their spoken language having changed in isolation along the way.

Therefore, a new paper co-authored by a University of Kansas professor of linguistics and published in a journal affiliated with the European Space Agency recommends that such crews include, if not a linguist, members with knowledge of what is likely to occur and how to adapt.

Associate Professor Andrew McKenzie of KU and Jeffrey Punske, assistant professor of linguistics at Southern Illinois University, co-authored the article "Language Development During Interstellar Travel" in the April edition of *Acta Futura*, the journal of the European Space Agency's Advanced Concepts Team.

In it, they discuss the concept of language change over time, citing such earthbound examples of long-distance voyages as the Polynesian island explorers and extrapolating from there.

It might seem far-fetched, but the authors cite language change even during their own lifetimes with the rise—no pun intended—of uptalk.

They write that "it is increasingly common for speakers to end statements with a rising intonation. This phenomenon, called uptalk (or sometimes High Rising Terminal), is often mistaken for a question tone by those without it in their grammars, but it actually sounds quite distinct and indicates politeness or inclusion. Uptalk has only been observed occurring within the last 40 years, but has spread from small groups of young Americans and Australians to most of the English-speaking world, even to many Baby Boomers who had not used it themselves as youth."

"Given more time, new grammatical forms can completely replace current ones."

Imagine trying to chat with Chaucer today. Even improvements in translation technology might not be enough.

"If you're on this vessel for 10 generations, new concepts will emerge, new social issues will come up, and people will create ways of talking about them," McKenzie said, "and these will become the vocabulary particular to the ship. People on Earth might never know about these words, unless there's a reason to tell them. And the further away you get, the less you're going to talk to people back home. Generations pass, and there's no one really back home to talk to. And there's not much you want to tell them, because they'll only find out years later, and then you'll hear back from them years after that.

"The connection to Earth dwindles over time. And eventually, perhaps, we'll get to the point where there's no real contact with Earth, except to send the occasional update.

"And as long as the language changes on the vessel, and then at an eventual colony, the question becomes 'Do we still bother learning how to communicate with people on Earth?' Yes. So if we have Earth English and vessel English, and they diverge over the years, you have to learn a little Earth English to send messages back, or to read the instruction manuals and information that came with the ship.

"Also, keep in mind that the language back on Earth is going to change, too, during that time. So they may well be communicating like we'd be using Latin—communicating with this version of the language nobody uses."

The authors also point out that an adaptation in the form of sign language will be needed for use with and among crew members who, genetics tell us, are sure to be born deaf.

In any case, they write, "every new vessel will essentially offload linguistic immigrants to a foreign land. Will they be discriminated against until their children and grandchildren learn the local language?

Can they establish communication with the colony ahead of time to learn the local language before arrival?

"Given the certainty that these issues will arise in scenarios such as these, and the uncertainty of exactly how they will progress, we strongly suggest that any crew exhibit strong levels of metalinguistic training in addition to simply knowing the required languages. There will be need for an informed linguistic policy on board that can be maintained without referring back to Earth-based regulations."

If a study of the linguistic changes aboard ship could be performed, it would only "add to its scientific value," McKenzie and Punske conclude.

More information: McKenzie, A. et al, Language Development During Interstellar Travel, *Acta Futura* DOI: 10.5281/zenodo.3747353

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