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Editorial introduction

## Technologies in a Multilingual World

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### Abstract

By way of introduction, the many relations are considered between technologies and languages in a multilingual world. The contemporary biotechnosphere is also a sphere where natural and technical languages intermingle. In particular, three questions will be considered, all three pertaining to the relation between the technological and the multilingual condition of modern life: To what extent does technology foster and create the multilingual condition? What do the competencies acquired for navigating under the multilingual condition tell us more generally about linguistic competence as a technical skill? How can technologies help us navigate and orient ourselves in a multilingual world? If languages are themselves fixtures of the world that afford orientation in our socio-technical environment and co-ordination among people, we will no longer absolutize our native language as a standard for proper understanding. We multilingually learn to technically orient ourselves and control our social and material world.

**Keywords:** Technology; Multilingualism; Language of technology; Multilingual world

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## Технологии в мультилингвальном мире

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### Аннотация

В качестве введения рассматриваются многие отношения между технологиями и языками в мультилингвальном мире. Современная биотехносфера также является сферой смешения естественных и технических языков. В частности, будут рассмотрены три вопроса, все три из них относятся к соотношению между технологическими и многоязычными условиями современной жизни: в какой степени технология способствует и создает мультилингвальные условия? Что приобретенные для навигации в условиях мультилингвизма навыки говорят нам в более общем плане о языковой компетенции как техническом навыке? Как технологии могут помочь нам ориентироваться и управлять мультилингвальным миром? Если языки сами по себе являются средствами, которые обеспечивают ориентацию в нашей социотехнической среде и координацию между людьми, мы больше не будем абсолютизировать естественные языки как стандарт для правильного понимания. Мы многоязычно учимся технически ориентироваться и контролировать наш социальный и материальный мир.

**Ключевые слова:** Технологии; Мультилингвизм; Язык технологии;  
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## INTRODUCTION

Creativity has been described as active adaptation to the world. But what if this world is a multilingual world – an environment in which we are surrounded by a multiplicity of languages and codes, more than anyone can produce or understand but which have to be navigated nonetheless? Aside from all the „natural languages,” including the many variants of English and all the local dialects, these include the language of the ticketing-machine as well as the language of powerpoint, the language that instructs the automatic loom as well as the language of traffic signs.

It was in the course of a large-scale engineering project – the construction of the tower of Babel – that humans were dispersed and separated by language. As technology keeps developing, are we still building a tower of Babel, creating new human-machine interfaces, multiplying signals and codes, sign systems, and many different ways of processing and transmitting natural languages? In this and other ways, an increasingly technological world makes for an increasingly multilingual world. At the same time, the increasingly multilingual world produces ever more advanced technologies and techniques of teaching and learning, sounding and translating languages. All this is reason enough to look more closely not just at language and technology, not just at bilingualism and technology, but at multilingualism and technology.

It is one thing if there are many languages but each person and each community grows up with just one. An insular culture that is defined by one native language may well hold on to its own standards and measures, using specially shaped electric plugs or peculiar traffic signs. To be sure, such islands of monolingualism hardly exist anymore. As soon as people enter into trade with others, they meet people from a different linguistic background. This is where bilingualism comes in and with it the question: How does one learn to speak and understand a language? Seeking not only to coordinate with others but to express ourselves or exchange ideas, we pursue an ideal of translation according to which one represents in one language the meaning of words and sentences from another language. Translation is a kind of transportation as thoughts become utterances first in one language and then the other, finally ending up – unadulterated – in the mind of the reader, listener, or recipient.

What happens to this ideal in a multilingual world in which one does not primarily translate or carry meaningful information across linguistic boundaries? In the multilingual condition one constantly moves between bubbles or nests that are dominated by different languages: People speak one language in their home and neighborhood, another in their city and state, yet another for professional purposes, moving among and between many linguistic as well as material cultures. With the inclusion of technical jargon, the arcane grammar of ticketing systems, the communication among gamers, and so much else, we might say that contemporary urbanites are confronted with a bewildering cacophony, with a babylonian confusion of languages. Under this multilingual condition, the ideal of translation as representation of meaning often fails to be satisfied and often is not even pursued. How important is it to grasp semantic content and to „understand“ when the real object is to successfully negotiate this multilingual world – to find our way about? Perhaps, in respect to many of the techno-linguistic systems that surround us, we are



like illiterates who cannot read or write in their own native language but have developed a remarkable competence or technical skill to compensate and live as if they did.

In this issue of *Technology and Language* we therefore propose to look at the relation between the technological and the multilingual condition of modern life, asking three questions: To what extent does technology foster and create the multilingual condition? What do the competencies acquired for navigating under the multilingual condition tell us more generally about linguistic competence as a technical skill? How can technologies help us navigate and orient ourselves in a multilingual world? Most generally and in respect to multilingualism as an academic subject, these questions are addressed in a dialogue between a linguist and a philosopher of technology (Hufiesen, Nordmann, & Liu, 2022). Several other papers contribute to the discussion of more particular questions.

## A MULTILINGUAL TECHNOSPHERE

How does technology contribute to the multilingual condition? There is a simple, perhaps superficial as well as a more profound or far-reaching answer. The simple answer considers the traffic of people and things. Even in the 18th century, if one wanted to import a steam engine, one needed to import a machine warden as well, and with Watt’s invention thus spread British culture and language. Much more of the same takes place under the heading of technology transfer, globalization, and a world wide web of social media – with Chinese engineering students coming to Russian universities, with United Nations inspectors visiting Iranian power plants, with German machines powering Japanese factories in Mexico, and so much more. Nations might be at war, trying to distance and dissociate themselves, but remain inextricably bound up in their inventions and the devices they use. Also it is technology that shapes trade and migration routes.

As for the more far-reaching and compelling answer, however, we have only to consider that our technical and social environments are saturated by natural and device languages – traffic lights and road signs, the whistles and bells of vehicles and dispensing machines, announcements in various languages, and the many scripts which govern the use even of ordinary technology (Latour, 2000). In light of all this, the human being is engulfed by a bewildering cacophony of letters and sounds, only some of which rooted in the natural languages.

What was always the case, to some extent, is taking new twists and turns as the technosphere expands and thus the challenge of multilingualism. Cats were domesticated as long as 7000 or 8000 years ago, and since then humans have been surrounded by some kind of cat-talk. Though we were never concerned until recently whether cats have a proper „language,“ most cat-owners have learned to understand their cats’ meows. If feline language was part of the unconsidered background of the multilingual condition, it is moving to the foreground thanks to technology: The same kind of machine learning which successfully produces translations of German, English, Russian, and Portuguese now offers translations between human and feline language as well. As Rostislav Skripchenko and Ivan Burlakov show in their contribution, cats’



meows have thus become an acknowledged part of the multilingual condition – even if they continue to pose questions and challenges of their own (Skripchenko and Burlakov, 2022).

If this is a story of an expanding technosphere, the close connection between language and technology can also constrain and restrict it. In Soviet trains, in order for water to flow from the tap, it was necessary to keep the inlet valve pressed. A somewhat arcane technological ritual ensured not only that water would not be wasted but prevented access by foreigners who are not familiar with such a system – who do not speak the language.

Tokens tell another kind of story. Their technical function is not unlike that of passwords today, they are the magic word that opens doors and gets things to work (Bylieva and Nordmann, 2021). The contribution on “Everyday problems of international students in the Russian language environment” provides the example of a student from Turkmenistan who for the very first time enters a metro-station. Not knowing about the required tokens she takes the advice to loudly state her full name at the turnstile, thus applying to be let in (Lobatyuk and Nam, 2022). Her apparent failure makes sense when one sees in the Saint Petersburg metro a crowd of people passing through closed turnstiles, apparently without stopping – what does one need to get into the underworld? If saying the name does not provide passage, a token does, and it carries a name as well, and any time soon facial recognition might do the job. The first bronze metro tokens in Moscow in 1935 were rich in signs. On one side there was an instruction “To pay for the fare – lower it into a machine,” on the other – the inscription “Metropolitan RSFSR Moscow 1935” and the Moscow emblem of that time. This sequence of symbols was completed by a hole in the form of a star (fig. 1).



**Figure 1.** Metro token (Moscow, 1935)

Larissa Aronin (2018) discussed objects of material culture as part of the multilingual human condition, with special emphasis on objects such as banknotes, billboards, and baked goods which integrate material and verbal components. Since tokens can be used for different machines, they need to verbally clarify to which technical system they belong. For example, a 1966 Israeli token for payphones contains the inscription telephone in Hebrew and Arabic, and the numbers arranged in a



semicircle, visually referring to the telephone's dial (fig. 2). Also there is the inscription „Israel Post“ and its symbol, a running deer, along with the year according to the Jewish calendar.



**Figure 2.** Payphone token (Israel, 1966)

In the case of material objects that are part of the technical world, their verbal or symbolic coding is part of the language of technology. And as in the case of combining several „natural“ languages, their relationships can be one of agreement, complementarity, or disagreement. Just as the „turbo“-button on the controls of a Chinese vacuum cleaner becomes a „violence“-button in Russian translation (Fig 3), so the Yekaterinburg subway tokens bear the inscription of the Moscow metro system.



**Figure 3.** Robot vacuum cleaner control panel with a “violence” button in the lower right corner



Thus the verbal coding can “repeat” or reveal a technical grammar, typically in the case of instruction, but it can also supplement or change the meaning. An archetypal example in popular culture of the contradiction between technical and verbal meanings is the red button with the inscription “do not press” – for example, in the online role-playing game *World of Warcraft* there is a huge red button hanging on the wall with the inscription “Do not press this button!” When pressed it starts a mechanism of self-destruction.

## TECHNO-LINGUAL COMPETENCE

At different levels of abstraction and with different kinds of instruments humans are trying to figure how things work in their world – a world which we can now describe as a multilingual biotechnosphere. Technical interventions tend to focus on the world of things where many of these things are made or shaped by people. Linguistic interventions similarly focus on the world of people which is populated by many things. Navigating a multiplicity of languages we learn how the social world as well as material culture works which gives rise to the question of how the multilingual condition brings to the fore the technical character of linguistic competence. This question is like the one raised in this issue by the contribution on Industrial music (Trofimov et al., 2022). Whether we consider today’s techno-sounds or the mythical constructivist *Symphony of Sirens* for ship-whistles or factory horns, this music is simultaneously more and less than traditional kinds of music (Schwartz, 2020). This music does not merely transgress the classical idiom and does not simply expand the very idea of music, it also illuminates the technical character of all music – starting with the „instruments“ via the notion of composition of „works“ all the way to the making and building of an artificial world that can be discovered and explored as well as playfully explored.

Music is sometimes said to be a universal language and at least in some traditions this is adduced to the fact that it is closely related to another universal language, namely that of mathematics. But as one sees on the payphone token (fig 2) already, this universal language is also subject to the multilingual condition with arabic numerals for the phone dial and Hebrew numerals for the year 5726 according to the Hebrew calendar. The language of mathematics is one in which we perform cognitive operations, it is instrumental or technical in many contexts. If these technical operations are affected by linguistic transformations, this will be another way in which we become aware of the technical dimension of linguistic competence as a way of navigating material culture and social world. The terms of a „universal language“ should be translatable into any language under preservation of meaning. The limits of this notion are subject of the contribution by Victor Krasnoschekov and Natalia Semenova who discuss the existence of multilingualism in mathematics, tracing it back to linguistic, historical and cultural features (Krasnoschekov & Semenova, 2022). Highlighting differences in mathematical terminology, they view this as an opportunity for students of mathematics and of engineering: These differences open a space for reflection and afford, perhaps, different modalities of operation and use.



Considering once more the payphone token with its Arab und Hebrew numerals, a perplexing question regards the „zero“ which was a peculiar mathematical achievement for the system of natural numbers (Rotman, 1993) and which perhaps looks very different in a system of alphabetic numerals in which 10, 20, 30 all have different names and do not share the „zero.“ It is an open question here and for many other examples whether these different conventions of naming make for different „metaphors we live by“ (Lakoff & Johnson, 2003). In the Australian aboriginal language Guugu Yimithirr, for example, the terms right and left, back and forward are missing (Spradley & McCurdy, 2012, p. 53). Instead, native speakers locate things within a geographical space, mapped in reference to the cardinal points, formulating: “You should take the southwest knife from the table.” Cardinal points are used even when describing what is happening on TV, taking the actual location and positioning of the TV set as a basis. In our language, in addition to operating with right/left we also use „clockwise“ to indicate a direction of movement. This word is grounded in a specific technology, giving rise to the question what happens to language and our conceptual thinking once this technology disappears from our culture. Our capacity to imagine and conceptualize recurrent circular motion is tied to the movement of the hands of a mechanical clock which is borrowed from a sundial in the northern hemisphere where the shadow moves accordingly. Deeply entrenched in a technical understanding of the world, will the idea of circular recurrence vanish with digital clockworks that simultaneously represent all timezones, south and north?

## TECHNOLOGIES FOR MULTILINGUAL LIVING

In a multilingual world one needs to figure how things work materially, symbolically, socially, technically. Technologies do not just increase the complexity of this world, they also provide the means to orient ourselves, navigate, even „master“ it. This is most evident for technologies in the area of language education. Digital technology can recreate multilingual environments and helps us „become“ multilingual, be it by supporting language learning, be it by supporting communicating across language boundaries. The contribution by Pavel Balshev (2022) shows how a digital lingual professional environment can be built where students improve both their language and professional skills. The article “Convergence of Foreign Language and Engineering Education: Opportunities for Development” explores in more detail the idea of combining language and engineering education (Krylov and Vasileva, 2022). For the implementation of this pedagogical approach, the integration of two languages is required: “the language of technology (or of engineering)” and the foreign language to be acquired.

Finally, however, there is a sense in which multilingual living is less limiting and less constrained than the simple life in a mono-lingual world. The philosophical tradition inhabits a monolingual mind-set, concerned with the ways in which our concepts structure our experience of reality, thus concerned with questions of knowledge and truth. Along with this came in post-Kantian philosophy the almost obsessive struggle against the insight that we are caught, indeed trapped within our



language. Whether one thinks with Herder or Humboldt about language as a creative process and energetic principle, or whether one thinks with Heidegger and Wittgenstein that, in language, the world is my world, this comes with the conviction that we cannot step outside language and that there is no vantage point from which one can judge how language relates to the world.

With the awareness of the multilingual condition comes quite another conviction since relative to each other all languages are on the outside of other languages, they appear artefactual, a such available for appropriation. If languages are themselves fixtures of the world that afford orientation in our socio-technical environment and co-ordination among people, we will no longer absolutize our native language as a standard for proper understanding. This is playfully empowering. No longer trapped in any one given language, we multilingually learn to technically orient ourselves and control our social and material world.

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