

Compagny

Neuroscience

Do multilinguals have a musical ear?

The "language bug" would exist and could go hand in hand with the musical ear. This is what the study by the Brain & Language Lab of the Universities of Geneva and Vienna attempts to determine, among other things

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What do music and language have in common? "The content of language is certainly more complex and precise than that of music, which has an emotional component that is functionally stronger, but all

both are used to communicate," says Professor Narly Golestani, director of the Brain and Language Lab and co-director of a project conducted between Geneva and Vienna with Professor Raphael Berthelè. Their study aims in part to confirm the results of previous research showing that people who are good at music were often also good at language. The anatomy of the brain, specifically the shape of the auditory cortex of the right and left hemispheres, would be indicative of this specificity.

"Typically, the right hemisphere handles the more musical or frequency distinction tasks, and the left hemisphere handles the fast acoustic processing related to the linear tasks - but this laterality can change depending on the level of expertise one has in one or the other field," says Narly Golestani.

However, language ability is not monolithic, says the director of the Brain and Language Lab. It's one thing to be able to differentiate and reproduce the specific sounds of a language, but it's another to master the

grammar and syntactic rules is another. "Some people speak a foreign language perfectly, but retain a strong accent, while others manage to reproduce the tones as if it were their native language, but multiply syntactic errors." The goal of Professor Golestani's team is to discover the corollaries of linguistic ability at these different levels. Multilingualism is, of course, also linked to cognitive abilities as a whole, to visual and auditory memory, and to the intelligence of each individual.

Evolving the teaching process

In addition to these different aspects of language aptitude, the motivation and situations that led an individual to become multilingual are diverse: "some people are passionate about languages and spend their evenings on language-learning applications, while others have become multilingual a bit in spite of themselves, following multiple moves around the world," notes Alessandra Rampinini, a post-doctoral fellow in neurolinguistics within the project, as well as at the National Centre of Competence in Research (NCCR) Evolving Language at the Unige. When it comes to music, the neuroscientific is all the more interested because she is a musician herself. "Language and music have points of contact, and this project is trying to determine whether the ability to understand differences in rhythm and melody at the musical level, helps assimilate them at the language level, whether these are abilities that develop together." Learning more about this could, according to the Italian researcher, make it possible to evolve the teaching of languages and the

To understand this is already to have a capacity for grammatical discrimination".

Early listening to certain types of music could thus have positive effects on grammar acquisition. Studies conducted as early as 2013 by the Rotman Research Institute in Toronto further revealed that speakers of tonal languages, found mostly in the Far East, Southeast Asia and Africa, would have more musical ears. However, Gavin M. Bidelman, professor in the Department of Language and Hearing Sciences at the University of Indiana, believes that the idea that speakers of these languages are necessarily better musicians should be dispelled.

Between Vienna and Geneva, the Narly Golestani is also interested in the question of the innate and the acquired in the study of language. At this stage, it appears that various aspects of the auditory cortex are more related to experience than to innate factors. "The thickness of the cortex - the gray matter surrounding our brain - would be more influenced by experience, while genetic factors would influence the surface area of a region [of the brain], and perhaps also the number of gyri" [a set of sinuous folds in the cerebral cortex], explains the project director.

Make way for music

The auditory cortex of people who have learned several languages early in life is, however, more fin, which would be due to a certain automatism acquired over time, and all the more so if the languages in question

of music. The University of Pisa graduate also participated in the "Jedem Kind ein Instrument" ("An instrument for every child", www.musicand-brain.de) of the Universities of Graz, Heidelberg and Vienna.

Grammatical discrimination

The rhythmic profile specific to each language could also be correlated with musical ability. "French has a very fixed rhythm, because the accent is always put on the last syllable, which determines a rhythm, a certain way of speaking. Italian and other languages, on the other hand, have no fixed accent, which changes their rhythmic and melodic profile a lot." The same language, depending on the accent of its speaker, will also have a very different rhythm.

As for the grammar, it could also, according to Alessandra Rampinini, have points of contact with the music. "On a score, musical phrases have a beginning, a center and a conclusion, which precedes what will follow or ends the piece.

are not close. "Heschl's gyrus [a gyrus in the superior temporal lobe containing the primary auditory area] may have one or more gyri or "bumps", which will be more likely to be observed in individuals with language ability." The link between musical ability and these "language bumps" remains to be discovered.

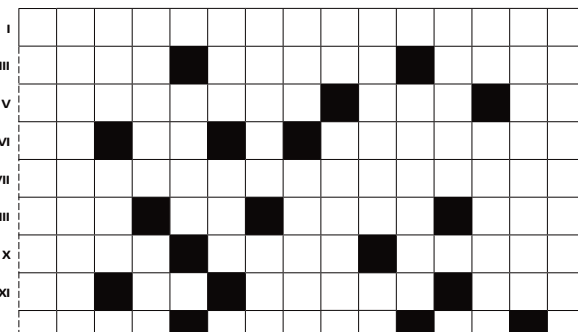
However, the already proven links between language and music should already make it possible to envisage new pedagogical practices, giving greater prominence to music. "Research on multilingualism has proven the benefits of early learning of a second or third language, as well as the usefulness of musical training for children, especially those suffering from dyslexia," insists Narly Golestani. In order to break down language barriers, including among Swiss citizens, there is only one watchword: music.

"Language enthusiasts spend their evenings on learning applications while others have become multilingual in spite of themselves".

Alessandra Rampinini, post-doctoral student in neurolinguistics

Crossword

Philippe Dupuis



XII XIII XIV XV

1 2 3 4 5 6 7 8 9 10
11 12 13 14 15

Grid 77

HORIZONTALLY I Only one species remains in our oceans, the others are fossilized. II Slightly indolent circle. Facilitates the reproduction. Lettuce of the sea. III Lost all its joy. Everything is better when it is full. Spat. IV Boss in region. Possessive. Open with delicacy at the top. V Allow to store and refill at any time. VI Light in the air. Always gives fever. Out of the oven. Affects morale and consciousness. VII Military operation. Everyone's share. Tidied up and filed. VIII For local distribution. Note. Summary shelter. A big one among the heavy ones. IX African course. Taking colors. Introduced possibilities. X From Bern and Freiburg. Covered and brilliantly protected. XI Painfully turns

red. Confidential
fold. **XII** Beautiful
child of Emile.
Native Americans of
Colorado. Kept for
him. **XIII** In our
dreams. Lying
without movement.
Preposition. For
lovers of foreign
canvases. **XIV**
Screwed up.
Goldfish. Keep the
room. **XV** Reserves
without
investments.

VERTICALLY 1

With
enthusiasm
and cordiality.
2 Passes his
food to water
before going to
the table. The
longest
Slovak
course. **3**
Flows in
Romania.
Helped those who
had nothing
yesterday.
Provides a strong
connection.
Personal. **4**
Species. Nice
introductions to get
from the kitchen to
the table. **5** Has
the role of the
villain in
Shakespeare.
Switched to
Chinese. **6** Doctors
of the world.
Grumbling of the
cruciverbalist. A
whole art that
requires
preparation. **7**
Among the
closest. As a thing,
it is everywhere.
Must not come to
miss.
8 Eliminates. Lost
corners. Opens
the week. **9** Deadly
in the end. Invade
the streets and
sidewalks. **10**
Remorse and
repentance.
Ecological choice.
Possessive. **11** Put
away. African
shelter. **12** Not
crazy, they say.
For slide lovers.
Inflated at sea. **13**
Staff. Hooked on
the bottom.
Nipponese drama.
14 Breath of air.
Belgian on the
Dyle. **15**
Indispensable in
everyday life.
Without forgetting
anyone.

Solution of grid 76

HORIZONTALLY

1 Intransportable. **2** Narine. Ara. Care. **III** Atomize. Cc. Lee.
IV Punished. Treuillées. **V** Prenions August. **VI** Ra. Irresolute. Do. **VII** They. Aises.
Ai. **VIII** Vionnet. Sessions. **IX** Ossu. Nidation. **X** le. Donor. De. **XI** Empty. Shield. Ve.
XII Agitated. Boar. **XIII** Base. Seante. Rm. **XIV** Bind. Auer. Asa. **XV** Es.
Aseptization.

VERTICALLY

1 Untouchable. **2** Naturalized. Gay. **3** Throne. SOS. Aimed.
4 Rimini. Nudity. **5** Ani. Iran. Ode. Ace. **6** Nestorian. Ue.
7 Ernestine. Sep. **8** Sloth. Dessert. **9** Or. Ossau. Aa.
10 Racial. Strings. **11** Cloutai. CGT. **12** Ace. Lue. Nodule.
13 Boletus. Acne. Ai. **14** Bound. Die. Verso. **15** Enesco. Superman.