



PRESS RELEASE

Food recognition in hundred-year-olds: this explains how our semantic memory works



A study by SISSA shows that, differently from younger individuals, centenarians recognise natural foods more accurately than processed foods, because they have eaten them with greater frequency during their lifetime. This result clarifies the mechanisms at the root of our semantic memory, that do not appear to depend on the characteristics of food alone but also on experience and eating habits throughout one's lifetime.

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Repeated life-long experience models our semantic memory, i.e. our knowledge related to objects and events. This also relates to our eating habits: the type of food we have eaten the most during our life, is the one we recognise with the greatest accuracy. This has been proven by a study enrolling people of various ages and a group of centenarians, led by a research team of SISSA-Scuola Internazionale Superiore di Studi Avanzati, coordinated by Raffaella I. Rumiati, in collaboration with the CAT project (Centenari a Trieste- Centenarians in Trieste). In this research,



just published in *Scientific Reports*, the team of scientists compared the recognition of natural foods (such as tomatoes, apples or aubergines) and processed foods (such as hamburgers or pizza) of three groups of elderly individuals of different ages with their eating habits. The key result is that the group of the oldest people, aged between 100 and 108 years, recognised and named natural foods with greater accuracy, the same type of food that had been the basis of their diet for their entire life, compared with processed foods, which they were less exposed to for reasons of age. The groups of younger elderly people, instead, showed the opposite behaviour, in line with their eating habits. These results shed new light on the understanding of how our semantic memory works. The research shows how this type of memory develops also in virtue of the experience accumulated throughout life. Furthermore, according to what is demonstrated by the group of SISSA, semantic memory would seem to remain stable until very late in life, declining only in the last decade of life.

What is semantic memory

«Semantic memory is a storage that allows us to acquire and save information on facts, episodes and abstract knowledge. The way in which the knowledge on what surrounds is organised allows us not only to give meaning and a name to what we have already encountered in life but also to understand environmental stimuli more easily» explains Miriam Vignardo, first author of the research. «It differentiates itself from episodic memory that collects specific events of our life and the context in which they occurred». The researcher continues: «Few studies have up to now investigated the role of experience in organising semantic memory: this is what we tried to do with this study».

Recognising food and eating habits

«For this study, we focused on food for its biological relevance and for the fact that its consumption has changed over time. What was eaten by those born in 1910 is certainly different



to what someone born in the following decades ate » explains Vignando. «This allowed us to compare distinct groups for period of birth and different eating experiences». The scientists enrolled three age groups of participants: the first aged between 54 and 74, the second between 75 and 91, and the third between 100 and 108. Each of them performed psycholinguistic tests, including different foods as stimuli, and the centenarians as well as a subset of 37 among the younger elderly adults, were also asked to describe the eating habits of a lifetime. «According to their answers, the diet of centenarians always included a larger amount of natural foods. This is reflected in their ability to name with greater accuracy the latter, compared with the processed foods, which they had less contact with during their lifetime». The other two groups showed the opposite behaviour, i.e. they fared much better with processed foods, which have been more frequent in their diet: «This means that the cultural context, habits and experiences pursued for many years can affect our semantic memory, even attenuating the biologically determined food characteristics, like the level of processing, perhaps in virtue of a higher caloric intake » explain Miriam Vignando and Raffaella Rumiati.

The decline of semantic memory

Unlike episodic memory, which tends to decline with ageing, the function of semantic memory was considered not to be compromised until a very old age. The study by The International School of Advanced Studies has confirmed and extended this data investigating this ability in a sample of centenarians: «In our study we observed that from 90 years of age on, there is also a rather evident and pronounced decline in this function. Understanding how semantic memory changes as people get older, is particularly important because a sign of its decline could be used as a possible early indicator of the onset of neurodegenerative diseases».

LINK:

The paper: <https://www.nature.com/articles/s41598-018-24776-3.pdf>



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