



## **Bilingual brains have higher volume of grey matter, study suggests**

Bilinguals do it better.

BEC CREW  
21 JUL 2015

The mental effort it takes to switch between multiple languages appears to reshape the brain, boosting grey matter volume in regions responsible for tasks such as learning and short-term memory retention, new research suggests.

The finding, by researchers at the Georgetown University Medical Centre in the US, adds to a growing body of research into how long-term experience with a particular skill can physically change a person's brain, and provides evidence to support the assumption that bilinguals have a cognitive advantage over monolinguals.

Right now, you'd be hard-pressed to find anyone who doesn't think a bilingual person has a distinct advantage over a monolingual person. Whether it's being more hireable, having an easier time travelling, or enjoying access to a deeper wealth of knowledge about the world, there are countless advantages to being fluent in more than one language.

But attitudes towards bilingualism haven't always been like this. In the past few decades, some researchers have argued that bilingualism in children can delay language development, [with one 1998 study](#) recommending that immigrant children be placed in all-English programs to ensure they don't fall behind, [and others arguing](#) that to encourage bilingualism is to hinder a child's assimilation into a new culture and community.

While the 'bilingual advantage' is a far more popular assumption now, it's been difficult to find concrete evidence of how language-learning affects the structure and function of a person's brain. Guinevere Eden, lead researcher in the Georgetown study, [explains in a press release](#) that inconsistencies in previous reports on the bilingual advantage have a lot to do with how researchers have tried to elicit and measure the advantages. So she decided to take a different approach and measure something more tangible: grey matter volume in adult bilinguals and monolinguals.

"Our aim was to address whether the constant management of two spoken languages leads to cognitive advantages and the larger grey matter we observed in Spanish-English bilinguals, or whether other aspects of being bilingual, such as the large vocabulary associated with having two languages, could account for this," [said one of Eden's team, Olumide Olulade](#).

The researchers compared grey matter volume in American Sign Language (ASL) bilinguals and spoken English-Spanish bilinguals with English monolinguals. While both the ASL-English and Spanish-English bilinguals share qualities associated with bilingualism, such as vocabulary size, only the ASL-English bilinguals were able to sign and speak at the same time. This gave the team an opportunity to test whether the need to inhibit one language in the brain while using the other might explain the bilingual advantage, or if it's just the effect of knowing a much wider vocabulary.

"We reasoned that the experience with two languages and the increased need for cognitive control to use them appropriately would result in brain changes in Spanish-English bilinguals when compared with English-speaking monolinguals," [said Eden](#). "And in fact, greater grey matter for bilinguals was observed in frontal and parietal brain regions that are involved in executive control."

Executive control in this context relates to the processing of tasks that require memory retention, reasoning, task flexibility, and problem solving, plus everything that goes into planning and executing those tasks. Having more grey matter in the regions responsible for executive control means a person is better equipped to process these tasks.

[Previous research](#) has shown that London taxi drivers - who pride themselves on memorising approximately 25,000 London streets and 20,000 landmarks - have greater grey matter volume in the regions of the brain involved in spatial navigation, which suggests they've trained their brains to better handle tasks involved in memorising routes and locations over many years.

"Unlike the findings for the Spanish-English bilinguals, we found no evidence for greater grey matter in the ASL-English bilinguals," [Olulade said](#). "Thus we conclude that the management of two spoken languages in the same modality, rather than simply a larger vocabulary, leads to the differences we observed in the Spanish-English bilinguals."

The results have been published in the journal [Cerebral Cortex](#).