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TITLE: The language we speak is the lens through which we see the world

Memory plays a crucial role in our lives: we do not only need memory to recall the knowledge acquired before an exam, but also to know where our home is located, and even who our friends and family are. In the absence of important diseases, all human beings have memory. However, memory may not work in the same way for all humans. One important factor that might affect our ability to store and recall information is the language we speak. The relationship between language and thought is controversial, but most researchers would agree that language may at least bias our attention towards certain aspects of the world. If a language has distinct names for several shades of red, for instance, its speakers will probably become “especially sensitive” toward the perception of shades of red, simply because their language habitually draws their attention on these differences.

Languages differ in many aspects. One of the most important one is the way in which words are ordered within sentences. In typical right-branching (RB) languages, like Italian, the main information (i.e. head) usually comes first, followed by a sequence of modifiers that provide additional information (e.g. “mother of John”; “the man who was sitting at the bus stop”). These sentences are thought to be processed incrementally, as heads are presented first and can be easily processed independently of the following modifiers. In left-branching (LB) languages like Japanese, in contrast, modifiers generally precede heads (e.g. “John’s mother”; “who was sitting at the bus stop, the man”). In LB languages, therefore, sentences can be highly ambiguous until the end, because modifiers often acquire a clear meaning only after the whole sentence has been parsed. Overall, RB speakers may make parsing decisions immediately, and thus would require no especially enhanced memory for the initial information. In contrast, LB speakers may have to retain initial modifiers in their working memory for a longer time, until the head is encountered and the sentence can be given a meaning.

In this study, we tested whether the branching of a language also affects our memory. In particular, does the branching of a language create linguistic habits, which affect how people recall non-linguistic stimuli? To test this hypothesis, we provided native speakers of eight different languages (four RB and four LB languages from Africa, Asia and Europe) with a series of different stimuli (i.e. pictures, numbers and grids with spatial information). We then tested whether LB speakers are better than RB speakers at recalling initial information. In working memory tasks, LB speakers were better than RB speakers at recalling initial stimuli. Crucially, however, LB speakers were worse at recalling final stimuli, showing that differences between RB and LB speakers were not due to overall differences in working memory, but rather reflected the branching of their language. Moreover, these differences held true even when controlling for other factors which might affect memory (e.g. economic status, age, education level). Therefore, our results strongly suggest that the language we speak forces us to parse sentences in specific ways, and that these linguistic habits are also extended to non-linguistic stimuli.

These results are especially interesting, because working memory is related to a variety of higher cognitive functions, including problem-solving, decision-making, reading and planning. In the future, it will be especially interesting to test native speakers of free word order languages, in which words can be ordered with a much higher flexibility within sentences. With more than 7000 languages in the world, we have an incredible pool to study the relation between language and cognition. Preserving this diversity is not only deeply ethical, but also scientifically necessary to better understand how our brains work.