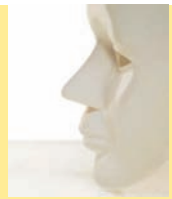
SEEING BOTH SIDES

DO PEOPLE WHO SPEAK DIFFERENT LANGUAGES THINK DIFFERENTLY?



How is language related to thought?

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How is language related to thought? Do people who speak different languages think differently? According to one theory, language offers the concepts and mechanisms for representing and making sense of our experience, thereby radically shaping the way we think. This strong view, famously associated with the writings of Benjamin Whorf (Whorf, 1956), is certainly wrong. Firstly, people possess many concepts which their language does not directly encode. For instance, the Mundurukú, an Amazonian indigene group, can recognize squares and trapezoids even though their language has no rich geometric terms (Dehaene, et al., 2006). Similarly, members of the Pirahã community in Brazil whose language lacks number words can nevertheless perform numerical computations involving large sets (even though they have trouble retaining this information in memory; Frank, et al., 2008). Secondly, there are often broad similarities in the ways different languages carve up domains of experience. For instance, crucial properties of color vocabularies across languages appear to be shaped by universal perceptual constraints (Regier et al., 2007). Also many languages seem to label basic tastes by distinct words (e.g., sweet, salt, sour and bitter; Majid & Levinson, 2008). The presence of constraints on cross-linguistic variation suggests that language categories are shaped by cognitive biases shared across humans.

A weaker version of the Whorfian view maintains that, even though language does not completely determine thought, it still affects people's habitual thought patterns by promoting the salience of some categories and downgrading others. One line of studies set out to examine how English and Japanese speakers draw the conceptual distinction between objects and substances. English distinguishes between count nouns (*a pyramid*) and mass nouns (*cork*), while Japanese does not (all nouns behave like mass nouns). When taught names for novel simple exemplars (e.g., a cork pyramid), which could in principle be considered either objects or substances, English speakers predominantly took the name to refer to the object ('pyramid') but Japanese speakers were at chance between the object or the substance ('cork') construal (Imai & Gentner, 1997). These findings have been interpreted as evidence that the linguistic count/mass distinction affects how people draw the conceptual object/substance distinction (at least for indeterminate cases).

Another set of studies focused on speakers of Tseltal Mayan living in Mexico, whose language lacks *left/right* terms for giving directions and locating things in the environment. Tseltal speakers cannot say things such as '*the cup is to my left*'; instead they use absolute co-ordinates (e.g., 'north' or 'south') to encode space. In a series of experiments, Tseltal speakers were shown to remember spatial scenes in terms of absolute co-ordinates rather than body-centered (left/right) spatial concepts; speakers of Dutch, a language which, like English, possesses left/right terms, showed the opposite preference (Levinson, 2003).

The precise interpretation of these findings is greatly debated. Firstly, studies such as the above simply show that linguistic behavior and cognitive preferences can co-vary, not that language *causes* cognition to differ across various linguistic populations. Furthermore, some of the reported cognitive differences may have been due to ambiguities in the way instructions to study participants were phrased. When Japanese and English speakers were asked to rate, on a scale from 1 to 7, how likely they were to classify a novel specimen as a kind of object or a kind of substance, their ratings converged (Li, et al., in press). Similarly, when Tseltal speakers were given implicit cues about how to solve spatial tasks, they were able to use left/right reasoning; in fact, on some tasks, they were more accurate when using left/right concepts compared to absolute co-ordinates, contrary to what one might expect on the basis of how Tseltal encodes space (Li, et al, 2005). These data show that human cognitive mechanisms are flexible rather than streamlined by linguistic terminology.

Other studies have confirmed that cross-linguistic differences do not necessarily lead to cognitive differences. For instance, memory and categorization of motion events, such as an airplane flying over a house, seem to be independent of the way languages encode motion (Papafragou et al., 2002). Relatedly, similarity judgments for containers such as jars, bottles and cups converge in speakers of different languages despite words for such containers varying cross-linguistically (Malt et al., 1999). In a striking recent demonstration, using eye tracking methods, English and Greek speakers were found to attend to different parts of an event while they were getting ready to describe the event verbally; however, when preparing to memorize the event for a later memory task, speakers of the two languages performed identically in terms of how they allocated attention, presumably because they relied on processes of event perception that are independent of language (Papafragou et al., 2008).

This research suggests that language can be usefully thought of as an additional route for encoding experience. Rather than permanently reshaping the processes supporting perception and cognitive processing, language offers an alternative, often optionally recruited system of encoding, organizing and tracking experience. The precise interplay between linguistic and cognitive functions will continue to be a topic of intense experimentation and theorizing for years to come.