

Debate opens anew on language and its effect on cognition

By Gareth Cook

GLOBE STAFF

In English, time rushes forward. In Mandarin Chinese, it moves down. The past lies above, and the future lies below.

So is the mind of a Mandarin speaker different from the mind of an English speaker?

The question is one of science's loaded topics, a politically charged theory with a racist past. But researchers now say they are uncovering proof that it may be true.

At a major scientific conference in Boston opening today, a half-dozen specialists in the resurgent field will debate the role of language in shaping the way people think about basic concepts such as space and time. A growing body of research suggests simple quirks of language — such as the lack of a word for left or right — can fundamentally alter the way people perceive the world around them.

Their findings could have dramatic implications for psychology, anthropology, and even international relations. But the researchers are cautious. Their work touches on politically divisive issues, such as the importance of bilingual education, and raises uncomfortable questions, such as whether speakers of certain languages are superior in some respects to others.

"This suggests the private mental lives of people who speak different languages may be very different," said Lera Boroditsky, an assistant professor at MIT who conducted an experiment comparing Mandarin and English speakers.

Boroditsky is one of the researchers presenting her work at the American Association for the Advancement of Science conference at the Hynes Veterans Convention Center this week. Last year, she published a study in which she asked people to answer simple time sequence questions while watching a video screen. When objects on the screen move vertically, the Mandarin speakers are able to answer faster than English speakers — implying that their brains processed time questions differently, and hinting that there could be other differences.

In some ways, this idea is not a new one. It first arose early in the 20th century in the writings of Benjamin Lee Whorf, an engineer who studied the Hopi Indians. The Hopi language does not have past, present, and future tenses, and Whorf theorized that the Hopi had a profoundly different notion of time than English speakers.

His idea — that language determined thought — became known as the "Whorfian hypothesis." At a time when the image of the noble savage held sway, the theory was both beguiling and influential. It took the romantic notion of a national character — that the French, for example, have a particular way of thinking — and extended it to all the planet's disparate tribes.

Arriving before the tools of modern linguistics and anthropology had been developed, the Whorfian hypothesis was used to support theories that ranged from arrogant to outright racist, such as the idea that "primitive" peoples were incapable of thinking about abstract ideas.

But as science progressed, Whorfian thinking crumbled. Anthropologists documented the cultural and verbal sophistication of supposedly primitive tribes. And linguists also came to realize that thoughts are much richer than language, undercutting the very notion that people would need a word to think a thought.

What researchers are probing now is whether each language, with its unique set of concepts and distinctions and vocabulary, causes people to experience the world differently — a feeling shared by many who have learned another language, but which has proven exceptionally difficult for scientists to document.

"There is this disconnect between the science and people's intuitions, but now I think that gap is being closed," said Boroditsky, whose work on Mandarin Chinese was published last year.

Outside of English, many languages give nouns a gender, a grammatical distinction that linguists have long considered to be without any real meaning. But in 2000 Boroditsky found that the system subtly changes a speaker's experience of everyday objects.

The word "key," for example, is masculine in German and feminine in Spanish. Boroditsky recruited two groups of volunteers, native German speakers and native Spanish speakers, who spoke English well. She then asked them to name three adjectives to describe objects.

She found a consistent pattern of German speakers using more masculine terms to describe the key — such as "hard, heavy, jag-

ged" — while Spanish speakers favored more feminine descriptions, such as "golden, intricate, lovely." Boroditsky said she is now considering studying how the design of bridges — a masculine word in Spanish, but a feminine word in German — differs between the two cultures.

Another researcher has found evidence that languages which have many terms for color, such as English, give their speakers an advantage in remembering them.

Critics say the findings are all small effects, well short of profound. "What happens to these neo-Whorfians is they keep backing off," said Lila Gleitman, a professor at the University of Pennsylvania. "Their position then becomes sufficiently weak that it holds no interest."

Now, though, the research is turning to even more controversial ground, how speakers of different languages remember events. Gleitman said she had just completed research, accepted but not yet published by the journal *Cognition*, showing that the different verb structures in English and Spanish do not cause speakers to remember events differently.

But Boroditsky said that she is beginning to uncover "interesting differences" in ongoing research into how speakers of Turkish and other languages remember events.

"Since September 11, the English-speaking world is waking up to the fact that other cultures not only speak differently, they think differently," said Susan Bassnett, a specialist on translation at the University of Warwick. "One of the problems of global English is that

native English speakers are losing their skills in foreign languages and so are increasingly unable to access those alternative realities."

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