Spatial Frames of Reference in Miyako: Digging into Whorfian linguistic relativity

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The Whorf-Sapir linguistic relativity hypothesis states that there are fundamental and pervasive influences of language on thought \cite{1}. Recently, spatial frames of reference have been used to investigate this hypothesis \cite{2}. While some linguistic groups have been found to prefer relative frames of reference (RFR; e.g., ‘left’ and ‘right’) to describe or think about relative positions of tabletop objects, others prefer absolute frames of reference (AFR; e.g., ‘north’, ‘south’) \cite{3}. A common interpretation of these results is that language plays a significant role in structuring fundamental domains (e.g., space) at a neurocognitive level \cite{4}. But, what happens with bilingual speakers with clashing absolute/relative frames of reference?

Speakers of Japanese have been reported to clearly prefer RFRs \cite{5}, while a few ethnographic descriptions have mentioned that bilingual speakers of Japanese and Okinawan languages often rely on AFRs \cite{6}. In this study we experimentally investigate the spatial frames of reference used by bilingual speakers of Miyako & Japanese and by monolingual speakers of Japanese from Tokyo.

We studied three groups of 8 participants each (13 men & 11 women, controlled for age), Miyako speakers speaking in Miyako (MM), Miyako speakers speaking in Japanese (MJ), and Japanese speakers (JJ). Working in dyads, each participant was asked to describe several arrays of figurines hidden to his/her partner, who was asked to reproduce the array according to the descriptions (procedure and materials from \cite{7}).

We analyzed the first frame of reference (taken to be a reliable indicator of a spontaneous construal) chosen by participants in each of the 4 trials. Results show that when Japanese was spoken, it strongly induced a RFR in JJ and MJ speakers. JJ participants never picked an AFR, and only two MJ participants occasionally picked an AFR (no difference was found between the proportions of AFRs per participant in these two groups, \(t(6)=1.4; \text{n.s.}\)). An ANOVA comparing the three groups (Fig. 1), however, was highly significant (\(F(2,21) = 23.1; p<.0001; \eta^2 = 0.69\)), indicating that Miyako speakers speaking in Miyako, despite being bilinguals, manifest a tangible preference for AFRs.

Our experimental results show that participants taken from a population of Miyako-Japanese bilingual speakers, tend to choose significantly more often AFR terms over RFR terms when speaking Miyako than when speaking Japanese. Because both languages possess full-blown lexical and grammatical resources for absolute and relative encoding, our findings call into question both, a strong and a weak version of the Whorf-Sapir hypothesis that it is the structure of languages that determines specific modes of thought. The preference of AFR by Miyako speakers while speaking Miyako, but not when speaking Japanese, seems to be due, at least in part, to cultural practices realized in the act of communicating in Miyako, rather than to cognitive restructuring driven by language proper.
References:

Example of linguistic manifestations of spatial frames of reference:
(1) hai atikaraa tuŋ=nu=du nisŋ=nkai futsŋ citti ŋ=nu kata=n
   Right, so the rooster is facing North, and it is (standing) on the west side. (MM speaker, facing South, describing a rooster figurine located on the right from the perspective of the participant and facing the participant)

(2) hidari+gawa=ni niwatori ce hidari=no hoo=o muiitemasu
   On the left side (there is) the chicken, it is facing left. (JJ speaker, facing South, describing a rooster figurine located on the left, facing left from the perspective of the participant)

Abbreviations: ACC Accusative, ALL Allative, DAT Dative, FIL Filler, FOC Focus, GEN Genitive, NOM Nominative, POL Polite