

Correlation between manner/path languages and sensorimotor tasks

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Our languages enable us to communicate several concepts, when we have the intention to do that, but they do not enable us to communicate everything and they somehow filter what we communicate. In fact, some linguists have gone so far as to claim that our languages eventually filter the way we perceive reality (Strong and Weak language-based hypothesis, Whorf, 1956; Lucy, 1992; Slobin, 1996). On the other hand, recent studies in cognitive linguistics based on Comrie (1981) and Jackendoff's (1992) universality of conceptual structures regardless of language suggest that sensorimotor input is the same for all humans and that language-independent categorization of events converges among native speakers of typologically different languages (despite the fact that the corresponding linguistic description does not). Rather than filtering perception, it is suggested that languages favour some available perspectives of perceiving events.

Initially, we attempt to investigate whether Gennari, Sloman, Malt & Fitch's results (2002) extend to: (a) the new pair of manner/path languages and (b) the prediction for strong/weak language-based hypothesis vs. universal conceptual structures. Furthermore, we investigate the role of physical objects and concrete environment to the perception of path and manner in visual scenes.

More specific, we attempt to clarify different lexicalization patterns of motion events in different languages in order to predict how their speakers perform in nonlinguistic tasks, as previously Gennari and collaborators (2002) analyzed for Spanish and English. Since we intend to maintain the same linguistic divergence, we substitute English with another manner language (German) and Spanish with a path language (Greek), even though the latter is considered both a path and mixed language (Talmy, 2000, II). At this point, an example drawn from the domain of motion will illuminate important aspects of the problem. Languages notoriously diverge in the representation of motion events. So, if native German and Greek speakers see the event "*a woman walking to the supermarket*", they are likely to verbally express as follows:

(1) Greek: I gineka pigo sto supermarket.
 'the woman went to the supermarket'

(2) German: Die Frau ging zum Supermarkt.
 'the woman walked to the supermarket'

The difference is that Greek language focuses on the path and not on the manner of motion while English and German tend to describe manner of motion. Of course, Greek has a verb for *walk* but speakers would use it only if they emphasize on the manner and not the path of the action. Therefore,

the phenomenon affects the vocabulary of languages: German seems to offer more verbs that describe how one moves as compared to Greek which seems to have a richer vocabulary to describe where one moves.

Based on the above mentioned typological difference, we investigate whether German and Greek lexicalization patterns influence recognition memory and similarity judgments of events. We formed video triads containing an anchor and two alternative events, in which the manner or the path of the anchor event is changed. We randomly distribute participants in three groups per language to encode the videos. In the first condition, participants of each language are asked to verbally describe the anchor event, while it is presented. In the second condition, participants watch the anchor event without any further encoding, and in the last condition they repeat nonsense syllables, which cause phonological suppression (Spiegel, Koester, Weigelt & Schack, 2012). After performing these three conditions, participants will view all the videos and

are expected to recognize only the anchor videos previously shown during the encoding. Once the recognition memory test is finished, they watch again all the videos to perform a similarity test. More precisely, the anchor video is presented first, it disappears and both alternated videos appear at the same time until the participant selects the similar one to the anchor video. Additionally to Gennari's experimental design, while videotaping the events, we captured the motion data of the performer (full body model) with a VICON motion capturing system. These data were presented to a fourth group of participants as avatars moving in an abstract environment. They were given similar instructions to the first condition, in order to compare the results in concrete and abstract environments.

References

- Comrie, B. (1981). *Language universals and language typology. Syntax and Morphology*. Oxford: Blackwell.
- Gennari, S.P., Sloman, S. A., Malt, B. C., & Fitch, W. T. (2002). Motion events in language and cognition. *Cognition*, 83(1), 49-79.
- Jackendoff, R.S. (1992). *Semantic structures* (Vol. 18). Cambridge (MA): MIT press.
- Lucy, J.A. (1992). *Language diversity and thought: A reformulation of the linguistic relativity hypothesis*. Cambridge: Cambridge University Press.
- Slobin, D.I. (1996). From "thought and language" to "thinking for speaking". In J. J. Gumperz & S. C. Levinson (eds.), *Rethinking linguistic relativity*. Cambridge: Cambridge University Press, 70-96.
- Spiegel, M.A., Koester, D., Weigelt, M. & Schack, T. (2012). The costs of changing an intended action: Movement planning, but not execution, interferes with verbal working memory. *Neuroscience Letters*, 509(2), 82-86.
- Talmy, L. (2000). *Toward a Cognitive Semantics, volume II: Typology and process in concept structuring*. i-viii, 1-495. Cambridge (MA): MIT Press.
- Whorf, B.L. (1956). *Language, Thought and Reality. Selected Writings of Benjamin Lee Whorf*. J. B. Carroll (Ed.). Cambridge (MA): MIT Press.