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Origins of Universality and Linguistic Diversity in Naming Human Gait

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Introduction

The search for universally shared elements of word meaning can shed light on how human languages are shaped as well as on shared aspects of human cognition: Do any such elements arise from a universal appreciation of structure that exists in the world, from universal properties of human information processing, or from universal human needs, interests, and concerns? Likewise, understanding how and why languages diverge in their word meanings can reveal how languages evolve word meanings and how cognitive processes shape this evolution.

We studied naming patterns across three languages in the domain of human locomotion (walking, running, skipping, etc.). This domain is universally experienced and highly structured, and there is an independent biomechanical description of that structure. Any universality is not likely determined at the level of the sensory apparatus (cf. the much-studied domain of color). These features allow us to ask whether a shared perception of structure in the world provides a constraint on the development of word meanings.

Portions of this domain vary in their centrality to human experience: Walking and running are universally the primary gaits, whereas hopping, skipping, etc. are more peripheral. And languages differ in how manner of movement is lexically encoded. Some typically encode manner in the verb (“She ran out of the room” [the English pattern]); others more typically encode path in the verb and manner only optionally in an adverbial phrase (“She exited the room {optional: running} [the pattern of e.g., Romance languages]). These features allow us to ask whether centrality to human experience and differences in verb lexicalization patterns across languages influence the degree of shared meaning.

We predicted that: (a) Strong universality would be found in the central portions of this domain; all languages tested would have manner verbs closely equivalent to “walk” and “run” in English. (b) Greater diversity would be found in more peripheral parts of the domain. (c) Manner verb languages would show greater linguistic differentiation

of the more peripheral parts of the domain than other languages.

Experiment 1

Monolingual native speakers of English, Spanish, and Japanese named 24 video clips of a student locomoting on a treadmill that varied systematically in speed and slope from low to high. Speakers of all three languages showed strong within-language agreement on names for clips and switched from one label to a different one at exactly the same points in the stimulus continuum -- points that corresponded to biomechanical discontinuities in the movements produced.

Experiment 2

Monolingual native speakers of English, Spanish, and Japanese named 36 video clips of a student locomoting on a static walkway. The student performed a range of examples of various biomechanically distinct gaits (e.g., several different versions each of walking, marching, and jumping). The central biomechanical distinction of walking vs. running was largely observed by speakers of all the languages. However, there were points of between-language disagreement on exemplars even here. The between-language disagreement for gaits more peripheral to human experience was greater, and speakers of English (a manner verb language) showed greater linguistic differentiation of the more peripheral gaits than did speakers of Spanish (a path verb language) and Japanese (a path-and-ground language).

Discussion

These results indicate that structure in the stimulus array provides a constraint on the cross-linguistic construction of meaning, but not an absolute one. Even in a strongly structured domain, some diversity in the meaning of terms can arise. The formulation of meaning is less constrained by stimulus structure in parts of the domain that are more peripheral to human experience, and independently existing typological differences in verb lexicalization patterns are a force that can contribute to diversity in meaning.