

A Discussion of Important Implications for Mathematics Learning in a Second Language and Second Cultural Environment

Elements of specific scientific views on learning that involve language theory, culture, and thought, will be presented in this paper along with their relevance to today's views for teaching mathematics to students who simultaneously are in a new cultural environment and are second language learners. Representing current teachers, the authors will compare and contrast their views to the views about such tenets as how culture influences language and whether language provides the foundation upon which thought is based or vice versa.

Throughout the paper, specific examples of language and mathematics, relative to different cultures such as Hispanic and Native American, will be interjected to highlight the concepts under discussion. These will be analyzed relative to standard School algorithms used in the contiguous United States to discover the underpinnings that distinguish the variety of cultural-mathematical viewpoints.

This paper on ethnomathematics will begin by describing the historical background in Anthropology espoused by Franz Boas that details strong anthropological links between culture and language. In general, Boas believed that different groups of people evolved in different ways and in fact, that individuals within each defined group of people, evolved in different ways. Due to these different intellectual groundings, he thought that the culture and the life influences of a given group of people were reflected in their language and, therefore, affected their language.

Bringing the discussion forward in time, the authors will explore some of the works of Boas's students, particularly Edward Sapir, and Sapir's student and colleague Benjamin Whorf. For instance, one revolutionary aspect of scientific experiments by Whorf which studied relationships between language, thought, and reality, looked at the grammatical structure of languages rather than the vocabulary. The landmark Sapir-Whorf Hypothesis, which states that the composition of any given language influences the thought patterns of its native speakers, will be examined for implications for today's students who are trying to learn while submerged in a non native language and cultural environment.

Steven Pinker's opposing viewpoint is that some language components are universal and that thought is independent of language. This concept will also be investigated along with references to other alternative approaches, for example, George Lakoff's assertion that "language is metaphor".

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