

Fig.1. Roots of German words represented as points. The coordinates are the frequency of occurrence and the number of different words, which use this root. The scale is logarithmic.

One should be aware that the cortical areas supporting language take shape during language acquisition in childhood. The words (roots) which are used more often will be represented in the cortex in more favorable places for the everyday use than the rare words (roots). This is just the case for the plot shown in Fig.1.

*Supported by RFBR 09-02-12144-ofi\_m grant.*

1. Zipf G. K., 1949, Human Behaviour and the Principle of Least-Effort: an introduction to human ecology. Addison-Wesley, Cambridge, MA.

2. Die Liste der 30.000 häufigsten Wortformen aus den Textkorpora des IDS, absteigend sortiert nach relativer Häufigkeit. Institut für Deutsche Sprache. <http://www.ids-mannheim.de/>.

3. Voigt, W. Wie viele Wörter hat eine Sprache - zum Beispiel die deutsche? (unveröffentlichtes Manuskript © 1999), <http://www.konservativ.de/sprache/voigt1.htm>.

4. Vvedensky V.L., Distributions of verbs and adverbs on the multidimensional sphere. Text Processing and Cognitive Technologies, v.15, 2008: Proceedings of X International Conference "Cognitive Modeling in Linguistics", Becici, Montenegro, Volume 2, pp.256-268.

5. Vvedensky, V.L., Combinations of verbs with adverbs reveal hypersphere in 9-D space imbedding words. The Third International Conference on Cognitive Science, 2008, Moscow, Russia. Abstracts Volume 1 pp.164-165.

## DIMENSIONAL DIRECTIONALS IN UPPER KUSKOKWIM ATHABASKAN: ORIENTATION IN PHYSICAL AND COGNITIVE SPACE

Aleksey S. Zverev<sup>1</sup>, Andrej A. Kibrik<sup>2</sup>  
zvereval@inbox.ru, aakibrik@gmail.com

<sup>1</sup>Moscow State University (Russia)

<sup>2</sup>Institute of Linguistics, Russian Academy of Sciences (Moscow, Russia)

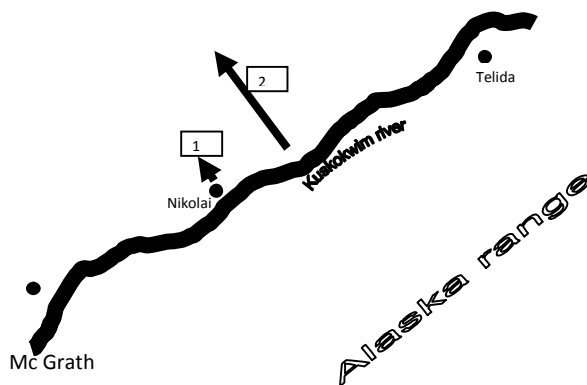
In this talk we discuss the organization of spatial representation in the ethnic worldview characteristic of a minority community of central Alaska: Upper Kuskokwim Athabaskan (UKA). Spatial representation, extremely important for the traditionally nomadic UKA speakers, is

revealed through the intricate and complex system of directional adverbs. In this talk we concentrate on one subclass of directional adverbs – those that can be called dimensional directionals.

**Dimensional directionals** (henceforth: DDs) in northern Athabaskan languages, including UKA, designate locations and directions of movement with respect to certain spatial dimensions that organize the universe of language users. DDs are extremely frequent in natural UKA discourse and are nearly obligatory in clauses describing location or movement. Analysis, elicitation and understanding of DDs is

only possible in the natural environment of language use, in which semantic dimensions naturally align with the surrounding landmarks, such as rivers and mountains. DDs are typically accompanied by pointing gestures by language users. Evidence for this talk consists of an analysis of natural discourse and of a bulk of elicited examples, paired with detailed comments on relevant parameters of the surrounding space.

Formally, DDs can be described as template-based words comprising at least six linear positions. Semantically, DDs are defined with respect to two dimensions: upriver vs. downriver and uphill vs. downhill. The schematic representation below demonstrates the UKA ecumene with the major landmarks: the Kuskokwim river flowing from NE to SW, the Alaska range, oriented roughly in a parallel direction, and the major UKA villages.



**Riverine orientation: Upriver vs. downriver.** The concepts ‘upriver’ and ‘downriver’ are conveyed by the directional roots

–*n-* and –*d-*, respectively. Directional words are based on these roots and contain certain prefixes and suffixes. Examples:

(1) y-o-n-aʔ                      zido    ‘He lives upriver’  
 PREF-PREF-upriver-ID    he.lives

(2) n-o-d-o-tsʔ                      tekash    ‘Come this way (by boat, from downriver)’  
 PREF-PREF-downriver-ID-EL    you.paddle

In particular uses, the concepts ‘upriver’ and ‘downriver’ can render both the general direction in which the Kuskokwim river flows and, at a local scale (the river is very windy) relative position along the stream.

**Elevational orientation: Uphill vs. downhill.** These two concepts are conveyed by the directional roots –*n(w)g-* and –*ts-*, respectively. Examples:

(3) n-o-ts-in                      tighisyoʔ ‘I will go downhill’  
 PREF-PREF-downhill-ID    I.will.go

(4) minh    y-o-ng-w-t                      ‘The lake is up there’  
 lake    PREF-PREF-uphill- ID-PUNCT

The concepts ‘uphill’ and ‘downhill’ can apply to areas of different scale. At a grand scale, they are based on the Alaska Range mountains as the landmark. In accordance with the relative locations of the UKA area and the Alaska Range, the ‘uphill’ and the ‘downhill’ DDs are used as designations of the SE and the

NW directions. In contrast, at a local scale, the elevational DDs are based on the surface of the river as the landmark and thus mean ‘away from the river’ and ‘at/towards the river’, respectively.

**Deictic orientation.** The use of DDs is inherently oriented to the position of a viewer, or