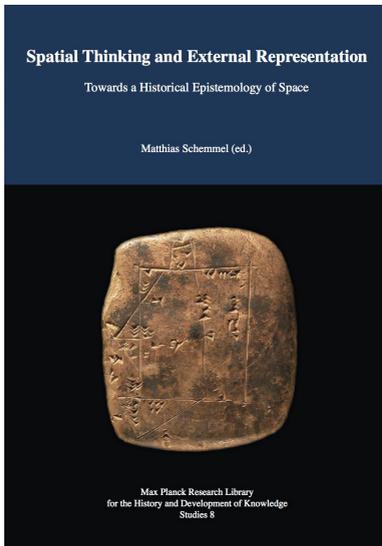


# Max Planck Research Library for the History and Development of Knowledge

## Studies 8

*Martin Thiering and Wulf Schiefenhövel:*

Spatial Concepts in Non-Literate Societies: Language and Practice in Eipo and Dene Chipewyan



In: Matthias Schemmel (ed.): *Spatial Thinking and External Representation : Towards a Historical Epistemology of Space*

Online version at <http://mprl-series.mpg.de/studies/8/>

ISBN 978-3-945561-08-9

First published 2016 by Edition Open Access, Max Planck Institute for the History of Science under Creative Commons by-nc-sa 3.0 Germany Licence.

<http://creativecommons.org/licenses/by-nc-sa/3.0/de/>

Printed and distributed by:

PRO BUSINESS digital printing Deutschland GmbH, Berlin

<http://www.book-on-demand.de/shop/15022>

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>

## Chapter 2

### Spatial Concepts in Non-Literate Societies: Language and Practice in Eipo and Dene Chipewyan

*Martin Thiering and Wulf Schiefenhövel*

#### 2.1 Introduction

This chapter focuses on the linguistic representation of spatial concepts in two little known and unrelated languages with a non-written tradition. It explores the degree to which environmental experience and spatial orientation is reflected in language, i.e., it is in line with anthropological linguistic approaches placing language in its social and cultural context, and its cultural practices.<sup>1</sup> As such, spatial knowledge is not only encoded in concepts or categories, but is embodied in the lived histories of human beings, and their cultural and linguistic practices.<sup>2</sup>

The unrelated cultures under survey present interesting environmental terrains: one is an alpine region (Eipo), the other comprises vast prairies (Dene). The mental and perceptual course-maintaining processes in these cultures rely on cognitive maps.<sup>3</sup> We assume very fundamentally that *Homo sapiens*, like all other animals, is equipped with biological, especially neurobiological dispositions enabling orientation in space and thereby ensuring survival and, ultimately, reproduction. As has been argued in Chapter 1 of this book, the ability of cognitive mapping is part of this biological disposition. Cognitive maps are structures of spatial reasoning; they are processes of unconscious inference.<sup>4</sup> We understand cognitive maps as establishing a relation between the ‘real world’ cues (such as objects and places) and their mental equivalents. This will give us the opportunity to relate environmental conditions to structures of spatial cognition as they are reflected in linguistic and enactive presentations.

This chapter deviates from the descriptions of landscape features in the sense that it adopts cognitive maps that are referred to in navigation techniques of orientation, i.e., navigating without instruments. We argue that this kind of navigation is based on dynamic cognitive maps and mental triangulation. This enables the navigators to have a spatial conception of their position at any time. It is argued here that this is of special importance not only for piloting but also for orienting oneself on land. We show this for the alpine regions of the Eipo and the vast prairies extensions of the Dene in Alberta.

We adopt the premise that<sup>5</sup>

---

<sup>1</sup>Foley 1997, Mark et al. 2011.

<sup>2</sup>Foley 1997, 177.

<sup>3</sup>Portugali 1996.

<sup>4</sup>Knauff 2013.

<sup>5</sup>Siegel and White 1975, 11.

descriptions of space, or allusions to space in language, must rest on two kinds of knowledge. The first appears to be based on models (maps, representations) which people construct to guide *spatial behavior*. The second appears to consist of a linguistic symbol-system that allows the models to be shared within a community of discourse.

The question is whether there are commonalities between the two unrelated languages, and if differences appear, what form do they take linguistically and conceptually? The following quote summarizes our point of departure.<sup>6</sup>

Man, in confronting reality, faces a kaleidoscope of phenomena ranging from the natural to the man-made, to the imaginary, to the totally abstract. Comprehension of such a broad inventory of reality and non-reality requires language, the tool that permits man to take verbal stock of objective and subjective experiences alike. In man's ongoing endeavor to conceptualize and verbalize a world that can never be fully known, language is the vital intermediary.

Our question here concerns the relationship between non-linguistic information and spatial language. One language, Eipo, is spoken in the central mountains of the Indonesian Province of Papua, formerly the province of Irian Jaya, West New Guinea. The other language, Dene Chipewyan, is spoken in Cold Lake, Alberta. The point of departure in our argumentation is that non-linguistic information has its impact upon spatial language and categorization, i.e., with reference to space and its relation to semiotic systems. We present language data indicating the influence of environmental landmarks and cultural heritage in shaping spatial categorization in the two languages. In this chapter landmarks are defined as any kind of environmental reference points. This can be a mountain, a river, a house, or even a tree (see section 2.2).

In accordance with the exposition given in Chapter 1, it is assumed that spatial concepts develop in the course of ontogeny on the basis of cognitive structures resulting from phylogeny. This development depends on the experiences of a speaker and the common concepts in the speaker's community in a particular culture at a particular time. In the course of our argumentation we present some fundamental spatial concepts and representations based on anthropomorphic spatial knowledge in Eipo and Dene Chipewyan. Knowledge members of both cultures developed on the basis of human phylogenetic adaptations throughout their ontogenesis in a remote area in West New Guinea and Western Canada. The term *culture* has several meanings and theoretical backgrounds. We adopt the specific idea of *culture* following Clifford Geertz's *Interpretation of Culture*.<sup>7</sup>

The concept of culture is essentially a semiotic one. Believing that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretative one in search of meaning.

We show such webs of basic spatial categorization in the two cultures, i.e., we present a snapshot of spatial semantics represented by the two languages. Moreover, this chapter posits its

---

<sup>6</sup>Malotki 1983, 13.

<sup>7</sup>Geertz 1999, 5.

arguments on the basis of species-specific cognitive organization that matures and shapes in the course of ontogenesis during sensorimotor action and sociocultural learning.<sup>8</sup> Spatial cognition is externally represented in language as well as in cultural-specific practices.<sup>9</sup> Note that language is understood here as an external representation of mental concepts, or, as Boas puts it, human language is one of the most important manifestations of mental life.<sup>10</sup>

The chapter is structured as follows: we first present some theoretical fundamentals of cognitive linguistics (section 2.2), followed by anthropological outlines of Dene Chipewyan (section 2.3) and Eipo (section 2.4). We then present some selected examples of spatial concepts in Eipo (center and periphery and natural limitations, distance, and orientation in Eipo; section 2.5). Finally, we compare representations of spaces in Dene and Eipo based on a variety of data sets (section 2.6). For the case of the Eipo, data are used from the dictionary of the Eipo language containing actual usages of the recorded utterances as well as published material from Schiefenhövel and Heeschen.<sup>11</sup> Additionally, we rely on a collection of myths, songs, and stories from Eipo speakers.<sup>12</sup> For the case of Dene, first hand data were elicited by Thiering with Dene Chipewyan speakers, based on various elicitation tools and interviews.<sup>13</sup> We conclude the chapter with some general comments (section 2.7).

## 2.2 Theoretical frame

### 2.2.1 Cognitive maps

Descriptions of space are based on internal models of knowledge representation of the environment. Such models are defined in cognitive psychology as *mental models* (or, depending on the authors, using concepts such as *scripts*, *slots*, *frame-systems*, *fillers*, *schemas*, *idealized cognitive models*, *mental spaces*). More specifically, *cognitive maps* represent the geometric layout of the differentiated topography of a space (via toponyms). By definition, a cognitive map or survey representation of a spatial layout encodes relations (distances and directions) among behaviorally relevant *landmarks* within a coordinate reference system centered on the environment. We use the term coordinate system rather loosely, or as an analogy, since, in the context of practical orientation, we do not believe in a mathematical coordinate system represented in the brain. Still, in the case of spatial conceptualization the analogy helps to model and describe the cognitive function of representing environmental frames of reference as a cognitive device.

Cognitive maps function to support navigation, and, in turn, are created by navigation and exploration of large-scale space. During navigation and exploratory spatial behavior, landmarks are experienced sequentially in space and time. The process of constructing a cognitive map can be thought of as a process that places a mental ‘copy’ of each sequentially experienced landmark into a simultaneous system that preserves metric information about the linear distance between landmarks, and their direction relative to one another.

<sup>8</sup>Piaget and Inhelder 1956.

<sup>9</sup>Foley 1997, 169–178. See also Chapter 1 of this book.

<sup>10</sup>Boas 1977, 68.

<sup>11</sup>Heeschen and Schiefenhövel 1983.

<sup>12</sup>Heeschen 1990; there is also a rich collection of film material on the Eipo’s daily activities and cultural practices; see Blum et al. 1979–1996.

<sup>13</sup>Thiering 2006, Thiering 2009a, Thiering 2010; field notes by Thiering.

An important, emergent property of a simultaneous system is that the spatial relations between landmarks entered in the system, even those relations not directly experienced, are also available.

Cognitive maps express the essential structure of spatial information encoded in our memories through learning processes. Like cartographic maps, cognitive maps can be constructed using many different sources of information and encoding processes. Some cognitive maps may be stored as permanent structures in long-term memory, e.g., a cognitive map of a familiar city, while others may be temporary structures for the current state of a dynamic environment, e.g., parents keeping track of the locations of children as they play in a park. In either case the characteristics of objects are thought to be stored along with their spatial locations. Hence, a cognitive map is, in the simplest terms, the encoding of a structure in our memory of what is where, i.e., such maps are essentially individualized internal representations or models of the worlds in which we live.

The processes used to acquire spatial knowledge appear to have a fundamental impact on the character of a cognitive map. The nature of cognitive maps produced by different encoding processes and the focus on understanding the circumstances that produce cognitive maps with fixed orientations and those that produce orientation-free cognitive maps is at issue here. Cognitive mapping is<sup>14</sup>

the process composed of a series of psychological transformations by which an individual acquires, stores, recalls, and decodes information about relative locations and attributes of the phenomena in his everyday spatial environment.

The end product of a cognitive mapping process is a cognitive map.<sup>15</sup> Cognitive mapping is a recording process in memory of the existence of an object and its known location in space. Within a given visual image, a large number of landmarks are simultaneously visible, so relative distances and directions are easy to judge.<sup>16</sup>

The next subsection examines the usage of cognitive maps with respect to landmarks serving as anchorage points to navigate and orient oneself in a known and unknown environment.

### 2.2.2 Landmarks

At focus in the very different environments under review, i.e., alpine vs. prairies, are landmarks as external points of reference. Moreover, in this chapter landmarks are defined as any kind of cultural-specific environmental reference points. This can be the above-mentioned mountains, rivers, houses, rocks, or even a tree. Landmarks are points of reference external to the person. In a city, landmarks may be distant buildings or geographical features that can be seen from many angles and distances, or they may be primarily local such as buildings, signs, trees, storefronts, doorknobs, or other urban details.<sup>17</sup> Siegel and White argue that landmarks are unique configurations of perceptual events (patterns). They identify a specific geographical location. A person's account of his spatial representations generally

---

<sup>14</sup>Downs and Stea 1973, 7.

<sup>15</sup>Tolman 1948.

<sup>16</sup>Kuipers 1982, 203.

<sup>17</sup>Miller and Johnson-Laird 1976, 378.

begins with landmarks, and these landmarks are the strategic foci to and from which the person moves or travels. Landmarks are used as proximate course-maintaining devices. They not only identify beginnings and endings, but also serve to maintain course.<sup>18</sup>

Arguably, landmarks shape and determine a detailed topographical map of the environment as represented via language. The following quote by Fowler and Turner summarizes the function of landmarks or geographic features in particular. This quote also summarizes our point of departure with respect to the function of environmental knowledge and its reflection in language.<sup>19</sup>

The naming of geographic features as part of territorial marking and orientation is a common occurrence in all cultures [...]. Usually, topographical names reflect specific cultural interests and historical developments within the possibilities given by the morphology of the language.

Fowler and Turner clearly point out that the process of naming geographic and territorial landmarks is crucial in all cultures. More specifically they conclude that topographical names indicate particular cultural interests as represented by the language repertoire, toponyms, or the language-specific affordances. Indeed, data presented here show a rather dense linguistic system of topographical maps represented, e.g., in place names serving as mental maps for orientation. It is furthermore argued that human beings instantiate relations between objects relying on various frames of reference that, as the name implies, serve as reference points to locate participants (see below). These reference points anchor a specific orientation between objects and the viewer.<sup>20</sup> These linguistic coordinates are important for the description of topographical spatial relations in Dene and Eipo, as they are for the description of projective relations in general.<sup>21</sup>

It is believed that travelers locate their current position on the Earth's surface symbolically within a cognitive map. For orientation in the environment relying on toponyms the traveler must compare the necessary direction of travel toward the destination using the respective cognitive map for orientation. To conduct a survey without instruments, distance and heading are conceptualized as movement, or change of position, within a cognitive map. At any time the traveler can estimate distance from and direction of known points such as the starting point. Hence, the difficult aspect is to retain a sense of direction especially without any visible landmarks, as in dead reckoning navigation.<sup>22</sup> As we argue, orientation processes on sea as well as on land are based on some fundamentals in mental triangulation and gestalt theoretic conceptions of spatial relations (figure-ground asymmetries; see below).

A prominent example from orientation on water comes from navigation without instruments.<sup>23</sup> More specifically, one method in navigation is dead reckoning. It depends on determining one's position at any time based on the distance and direction traveled since leaving the last known location.<sup>24</sup> The navigator monitors the motion of the boat to deter-

<sup>18</sup>Siegel and White 1975, 23.

<sup>19</sup>Fowler and Turner 1999, 424. For a detailed categorization of spatial relations, see Miller and Johnson-Laird 1976, 377.

<sup>20</sup>L. Carlson-Radvansky 1993, L. Carlson-Radvansky and G. Carlson-Radvansky 1996, Carlson and Logan 2001, Carlson 2003, Levinson 2003, Levinson and Wilkins 2006.

<sup>21</sup>Malotki 1983, 16.

<sup>22</sup>Gladwin 1974, Hutchins 1996, Sarfert 1911.

<sup>23</sup>Hutchins 1996, 65–93; see also Hutchins 1983 and Chapter 1 in the present book.

<sup>24</sup>Gladwin 1974, 144.

mine the displacement from a previous position.<sup>25</sup> This mental computing or mental triangulation, i.e., the transformation and propagation of representational states, is arguably also used on land.<sup>26</sup> In addition to this method, travelers' reports, stories, symbols, icons or any other kind of representation are also examined to reconstruct cognitive maps of spatial orientation based on implicit knowledge systems.

Cognitive maps underly cognitive information-processing systems of spatial perception.<sup>27</sup> As is argued here, the specific encoding patterns vary in the orientation reference systems. Moreover, we consider spatial reference frames that construe a complex mental model or gestalt-like representation of knowledge. As such, course-maintaining systems on land and at sea based on different sorts of texts are of specific interest. The rationale behind this is to argue for describing cognitive maps as gestalt-like representations of environmental cues forming a dynamic mental model or cognitive map. What might be common to all cultures and hence be universal is the gestalt-like constructive process of cognitive maps. These cognitive maps function as implicit knowledge systems that enable people to navigate in a specific environment at a given time and space.

With respect to spatial orientation, Fowler and Turner point out:<sup>28</sup>

If peoples choose to orient themselves to coasts or seas, rivers or mountains, the Sun's path, or some other feature, some aspect of this will usually show up in their place names.

Adopting Fowler and Turner's point it will be shown that people in both of the cultures discussed here use place names in their specific environments to construct a linguistically dense topographical reference system for orientation. Hence, environmental experience is also represented via language, and language in turn shapes spatial concepts or mental models.<sup>29</sup> We will also present the rich fabric of terms of spatial deixis in both cultures under study. This highlights the importance of the notion of frames of reference here since they profile spatial relationships between the speaker-hearer and the environment.

### 2.2.3 Frames of reference

It is argued that human beings instantiate relations between objects relying on various frames of reference. Reference points are fundamental in ascribing specific orientations between objects.<sup>30</sup> These linguistic coordinates are important for the description of spatial topographical relations such as *an*, *on*, and *in*, in Dene and Eipo, as they are for the description of projective left-right relations in general.<sup>31</sup> Following Malotki, the term linguistic coordinate here means the division of a spatial configuration into a speaker, a hearer and a third part (a person or a thing the speaker-hearer refers to). Hence, a linguistic coordinate system is not a geographically or mathematically abstract concept, but a means of spatial categorization in the linguistic encoding.

---

<sup>25</sup>Hutchins 1996, 56.

<sup>26</sup>Hutchins 1996, 49.

<sup>27</sup>Marr 1982.

<sup>28</sup>Fowler and Turner 1999, 424.

<sup>29</sup>Thiering 2012.

<sup>30</sup>L. Carlson-Radvansky 1993, L. Carlson-Radvansky and G. Carlson-Radvansky 1996, Carlson 1999, Carlson and Logan 2001, Carlson 2003, Levinson 2003, Levinson and Wilkins 2006.

<sup>31</sup>Malotki 1983, 16.

The encoding of spatial relations depends on certain spatial (and temporal) parameters that set the linguistic coordinate reference system for the speaker-hearer. In general, spatial marking is based on three different reference frames to be selected from. These are assigned to the objects profiled in the situation.<sup>32</sup> The three frames of reference can be divided into

1. a viewer/ego-centered or relative frame, as in the English example *he's to the left of the house* (assuming that from the perspective of the viewer, a person is situated to the left side of the house),
2. an object-centered or intrinsic frame, as in *he's in front of the house* (assuming that the front is where the main door is located; the object has an inherent front and back side), and
3. an environment-centered or absolute frame, as in *he's north of the house*.

In (1), the viewpoint depends on the location of the viewer's vantage point and his/her relation to the figure and ground. The intrinsic frame in (2) is an object-centered reference system determined by natural or culture-specific inherent features of the object. Finally, the absolute frame (3) is a fixed direction provided by, e.g., cardinal direction.<sup>33</sup>

With respect to the figure-ground asymmetry we follow Talmy's adaptation of the *Gestalt* psychologist approach arguing that certain cognitive categories play an important role in attributing the primary and secondary objects of a scene.<sup>34</sup> These functions are encoded by the figure and ground of a scene, the variable element or positive space versus the reference element or negative space.<sup>35</sup> The former is usually the smaller and moveable object whereas the latter is usually the permanently located, larger object.<sup>36</sup> For more details, see the subsection following the next.

The Language and Cognition group at the Max Planck Institute in Nijmegen provides an exception to standard procedures in armchair linguistics. Elicitation tools developed by the researchers of this group facilitate the gathering of data from actual speakers and their usage of a particular language.<sup>37</sup> We argue that these ascriptions are determined by cultural, environmental and language-specific affordances.<sup>38</sup> These, in turn, depend on speaker-imposed figure-ground asymmetries that are attributed to the respective objects.<sup>39</sup> Another important concept for the discussion of spatial concepts is that of *ideas of space*.

## 2.2.4 Ideas of space

We argue that ideas of space (*Raumbilder*),<sup>40</sup> i.e., the speaker's basic delimitation of his/her world of experience, are important in Eipo and Dene, as in any other language and culture. A selection of such ideas of space are, for example, the deictic parsing of space into 'here', 'there', and 'over there' or simply 'celestial space' versus the 'Earth' as encoded via 'above'

<sup>32</sup>L. Carlson-Radvansky 1993, Carlson 1999, Carlson 2000, Carlson and Logan 2001, Carlson 2003, Levinson 2003, Coventry and Garrod 2004.

<sup>33</sup>For an extensive overview, see Levinson 2003.

<sup>34</sup>Talmy 1983, 230.

<sup>35</sup>Talmy 1978, 627, Hofstadter 1980, Talmy 1983, 232, Talmy 2000.

<sup>36</sup>See Talmy's 20 parameters for the domain of spatial configurations of figure-ground asymmetries; Talmy 1983, 277.

<sup>37</sup>Levinson 2003, Levinson and Wilkins 2006.

<sup>38</sup>Whorf 1956, Wygotski 1964, Watzlawick 1981, Hunt and Agnoli 1991, Lucy 1992b, Lucy 1992a.

<sup>39</sup>Talmy 1978, Talmy 1983, Talmy 2000.

<sup>40</sup>Malotki 1979.

and ‘down’. We have also *ideas of space* such as the ‘left’ and ‘right’ asymmetries, ‘in front of’ and ‘behind’, ‘up’ and ‘down’, ‘near’ and ‘far away’, ‘inside’ and ‘outside’, ‘in’ and ‘on’, the cardinal directions ‘North’, ‘South’, ‘West’, and ‘East’, ‘back’ and ‘forward’, man-made places such as a ‘house’ and ‘geographic places’ or ‘surfaces’.<sup>41</sup> Note that in contrast to Hopi, the Eipo language does not have true terms for cardinal directions, yet we believe that expressions such as ‘downstream’ and ‘upstream’ have a similar semantic function. Hence, it may be stated that Eipo also evokes a tripartite system of deictic reference. Note that this three way separation is similar to, e.g., German *hier* ‘here’, *da* ‘there’, *dort* ‘over there’ differentiating between proximal and distal distances, taking the speaker as the anchor of her/his perspective.

Malotki’s survey presents various facets of Hopi encoding of spatial relations and demonstrates a ‘degree of specificity’.<sup>42</sup> This linguistic phenomenon of the figure’s location with respect to the ground is related to the amount of detailed expressive content with which spatial relations are described in various languages.<sup>43</sup> It is claimed that, for example, the English prepositional phrase ‘X is on the table’ has a lower degree of specificity than the corresponding expression in other languages such as ‘X is located at the table’s upper surface’<sup>44</sup> as is the case in Ewe, a language spoken in the south-east of Ghana. The latter specification encodes further partitions of the table into smaller regions.<sup>45</sup>

In Chapter 5 of his analysis, Malotki<sup>46</sup> gives a detailed account including various illustrations of the different representations of space and spatial semantics as linguistically summarized in a total of 43 locational morpheme markers specifying space in Hopi;<sup>47</sup> the alphabetically ordered spatial morphemes are described in terms of content or semantic fields in Malotki’s concluding remarks.<sup>48</sup> He states that Hopi uses a fine-grained linguistic system to encode spatial relations and, we would add, spatial concepts that also differ, to a certain degree, from most other languages.<sup>49</sup> This should be of no surprise since every language presents language-specific affordances, i.e., the semantic content hard-wired into specific morphosyntactic devices or morphosyntactic patterns. As such, spatial concepts are linguistically represented in different forms which are based in the respective language system. Malotki concludes that<sup>50</sup>

owing to its differentiated construction of the locative with its punctive and diffuse subsystems as well as the locative and the destinative with their extreme and non-extreme partitions, respectively, the Hopi language forces its speakers to a sharper observation of certain areas of spatial reality than most other SAE languages.

<sup>41</sup>Malotki 1979, 294,297.

<sup>42</sup>Svorou 1993, Thiering 2013.

<sup>43</sup>Svorou 1993.

<sup>44</sup>Svorou 1993, 6–8, Langacker 2008, 19, 43, 55–57.

<sup>45</sup>Ameka 2006, 371.

<sup>46</sup>Malotki 1979, 144–261.

<sup>47</sup>Malotki 1979, 145–146.

<sup>48</sup>Malotki 1979, 295, 298.

<sup>49</sup>Malotki 1979, 293.

<sup>50</sup>SAE stands for *Standard Average European*. The German SAE original reads: “die Hopi-Sprache auf Grund ihrer differenzierten Gestaltung des Lokativs mit seinen punktiven und diffusen Subsystemen sowie des Lokativs und Destinativs mit ihren extremen bzw. nicht-extremen Untergliederungen ihre Sprecher zu einer schärferen Beachtung gewisser Bereiche der räumlichen Realität zwingt, als dies die meisten SAE-Sprachen tun.” (Malotki 1979, 299).

Thus, Malotki claims that Hopi-speakers are forced by their language, and, as we assume, by the environment, to pay more attention to spatial reality. He does not claim that this necessarily implies radical differences between the Hopi's 'Weltbild' and that of speakers of other languages.<sup>51</sup> He points out that the Hopi's idea of space might contain culture- and language-specific elements. Malotki believes that in particular aspects of spatial relations a difference in focus might lead to differences in thinking about space. This belief may be interpreted as an adherence to a modest form of linguistic relativism.<sup>52</sup>

Summing up, Malotki concludes that the Hopi language uses a fine-grained linguistic system to encode spatial relations. We would add that this language additionally uses spatial concepts that also differ from most other languages.<sup>53</sup> Similarly fine-grained spatial distinctions can be found in languages of other cultures. As an example we point to the spatial deixis terms used by peoples in the Alpine regions of Europe, which reflect a very precise relationship between the environment and language similar to that of Hopi.<sup>54</sup> As we demonstrate, Eipo and Dene Chipewyan also present crucial environment-dependent encoding patterns mirrored in the languages. The mountains and rivers as important limitations in Eipo, or lakes, in particular Cold Lake, rocks, trees and rivers in the Dene culture, show their repercussions in the language patterns and the carving-up of spatial concepts on the language level.

### 2.2.5 Figure-ground asymmetries

As we have seen, one of the major hypotheses in cognitive psychology (which was the precursor to cognitive linguistics) is the idea of mental representations as abstract schemas or mental models.<sup>55</sup> We know from gestalt psychological approaches that such schemas are supposedly universal and not language-specific. Moreover, they are non-linguistic mental representations of experience. They are extracted from more specific structures and categorize such structures through relations of full or partial schematicity.

The idea of mental representations leads more specifically to the general claim in cognitive linguistics that all grammatical structures are symbolic. Additionally, the lexicon, morphology, and syntax form a continuum of symbolic units, each residing in the association of a semantic and a phonological structure or pole.<sup>56</sup> Moreover, the meanings of linguistic expressions are conceptualizations shaped in accordance with the linguistic system. In addition, all facets of our general knowledge of a conceived entity contribute to the meaning of an expression which designates this entity and, given that, any sharp distinction between semantics and pragmatics is gratuitous.<sup>57</sup> Semantics is, in this view, not an autonomous cognitive module, nor is the linguistic system overall.

With respect to semantic structures it is claimed that they are predications that are characterized relative to cognitive domains such as time, space, and color. Most domains of

---

<sup>51</sup>Malotki 1979, 301.

<sup>52</sup>Malotki 1979, 301.

<sup>53</sup>Malotki 1979, 293.

<sup>54</sup>Berthele 2006.

<sup>55</sup>Gentner and Stevens 1983, Johnson-Laird 1983, Penrose 1991, Ritter, Martinetz, and Schulten 1991, Schade 1992, Schreuder and Flores d'Arcais 1989, Strube 1996.

<sup>56</sup>Langacker 1987.

<sup>57</sup>Nunberg 1978, Sweetser 1990.

linguistic relevance are non-primitive. That means they are interrelated networks.<sup>58</sup> As such, they involve cognitive structures of indefinite complexity, i.e., we have layers of interrelated networks that can be modeled in a connective fashion.<sup>59</sup> Any cognitive structure can function as the domain for a predication.<sup>60</sup> Moreover, meaning is conceived as cognitive processing, and even expressions used to describe a presumably objective situation may differ in meaning, depending on how the situation is construed. This is known from figure-ground reversals.<sup>61</sup> An expression imposes a particular image on its domain. Imagery is used as a technical term for the cognitive capacity to construe a cognitive domain in alternate ways.

The cognitive linguist Leonard Talmy introduced the figure-ground asymmetry stating that a physical object is located or moves with respect to another object which serves as a reference point.<sup>62</sup> This asymmetry is embedded in schematization. Schematization is the process involving the profiling of specific aspects of a reference point of a scene representing the whole gestalt.<sup>63</sup> Talmy defines the basic asymmetry in a schematization process as follows:<sup>64</sup>

The Figure object is a moving or conceptually movable point whose paths or site is conceived as a variable [...]. The Ground object is a reference-point, having a stationary setting within a reference-frame, with respect to which the figure's path or site receives characterization.

Talmy presents a list of various characteristics of the figure-ground asymmetry specifying the relationship, such as the figure being of greater concern or relevance (more salient) as opposed to the ground being of lesser concern or relevance (more backgrounded).<sup>65</sup> This semantic distribution is clearly different from the gestalt notion, which is perceptually based on geometric coordinates instead.<sup>66</sup>

Three basic factors determine the contrast between figure and ground: size, movement, and position of the figure in relation to the ground in the shared knowledge of the discourse participants. Talmy states that, e.g., adpositional phrases profile relationships such as the location of the figure in relation to the ground, the time of the unfolding event, the manner in which the event unfolds, and the transition, motion and path of the figure.<sup>67</sup>

An alternative dichotomy is introduced by Langacker who defines the asymmetry as a trajector (corresponding to the figure) in a relational profile to a landmark (corresponding to the ground).<sup>68</sup> He argues furthermore that<sup>69</sup>

[w]ith a few if any exceptions, relational predications display an inherent asymmetry in the presentation of their participants. This asymmetry is not reducible

<sup>58</sup>Wender 1980, Zell 1994.

<sup>59</sup>Bechtel and Abrahamsen 1991, Birbaumer and Schmidt 1993, Edelman 2002, Hillert 1987, Hillert 1992, Kandel and Hawkins 1994, Murre and Goebel 1996.

<sup>60</sup>Langacker 1987, 56.

<sup>61</sup>Thiering 2011.

<sup>62</sup>Talmy 1978, 627.

<sup>63</sup>Talmy 2000, Sinha and Kuteva 1995.

<sup>64</sup>Talmy 1978, 627, see also Talmy 2000, 315.

<sup>65</sup>Talmy 2000, 316.

<sup>66</sup>Lewin 1936.

<sup>67</sup>Talmy 2000.

<sup>68</sup>Langacker 1987, 231.

<sup>69</sup>Langacker 1987, 231.

to semantic roles, i.e. the nature of participants involvement in the profiled relationship. [...] it is observable even for predications that designate symmetrical relationships: X equals Y is not precisely equivalent semantically to Y equals X, nor is X resembles Y equivalent to Y resembles X. [...] In the expression X equals Y [...], X is referred to as a trajector, and Y as a landmark. This terminology reflects the intuitive judgment that Y provides a reference point with respect to which X is evaluated or situated [...].

Clearly, the semantic distinction between the two conceptually based categories reflects the fundamental notion in gestalt psychology of figure and ground.<sup>70</sup> It is believed here, however, that the gestalt psychologist's definition is much more complex and broader than the notions adopted in cognitive semantics. Nevertheless the basic idea of a reference object and an object that needs an anchor is similar. Conceptually, the cognitive semantic notion is very specific in the distribution of meaning components in a sentence. Talmy shows that arguably similar sentences such as (a) 'The bike is near the house' and (b) 'The house is near the bike' are not the same semantically. They present two different (inverse) forms of a symmetric relation.<sup>71</sup> In (a) the house is the reference object, and in (b) it is the bike. This latter profiling seems to be at odds with speakers' expectations. Depending on the real world situation, however, a speaker might refer to the bike as the reference object for various reasons. Zlatev presents a similar example in support of construed situations. In the expressions (a) 'The tree is by the car' and (b) 'The car is by the tree' different situations are encoded. These differences indicate different worlds of human experience, i.e., a non-objectivist approach is favored here.<sup>72</sup> Hence, the semantic function chosen by the speaker does not necessarily correspond to the world of part-whole partitioning, but constitutes language-specific information. This might be due to pragmatics or culture-specific decisions or biases. This example already reveals that language, or rather, speakers choose to reverse natural figure-ground asymmetries. The selected empirical evidence presented in this chapter supports this observation as well.

With this description of some basic theoretical features at hand we shall now consider the two cultures at focus here. The theoretical notions just outlined are important for the analysis of the following language examples.

### 2.3 Anthropological and linguistic background: Dene Chipewyan

This section presents anthropological background information of the Dene culture and linguistic knowledge that speakers of Dene relied on in their daily interaction with the environment.<sup>73</sup> We provide information on the cultural backgrounds as well as language examples of spatial orientation. The Eipo language and culture is then presented in section 2.4.

---

<sup>70</sup>Koffka 1935, 177–210, Rubin 1921.

<sup>71</sup>Talmy 2000, 314.

<sup>72</sup>Zlatev 2003, 332.

<sup>73</sup>The past tense indicates the drastic change the Dene culture has undergone in the past decades.

### 2.3.1 Contact history and recent acculturation

Dene Chipewyan presents a rather interesting status quo in terms of the actual cultural heritage and the influence of Western culture.<sup>74</sup> Dene Chipewyan belongs to the Northern branch of the Athapaskan language family (spoken primarily in northwestern Canada). The Dene territory extends (or rather, extended) from the southern shore of the Great Slave Lake (Northwest Territories) east to Churchill, Manitoba and south to central Alberta/Saskatchewan.<sup>75</sup> Perhaps partly due to this geographic isolation similar to Hopi, the Dene dialect of the Cold Lake region is rather conservative with a particularly rich morphology.<sup>76</sup> Only about 2,000 speakers are left in Cold Lake, and only 10% at most speak Dene fluently and on a daily basis.

The Cold Lake First Nations Dene Chipewyan people live near Cold Lake, Alberta, approximately 300 kilometers north-east of Edmonton on the Alberta and Saskatchewan border. Genetically, the Dene language is related to Bearlake, Beaver, Carrier, Chilcotin, Dogrib, Eyak,<sup>77</sup> Hare, Kutchin, Sarsi, Sekani, Slavey, Tahltan, Tsetsaut, Tutchone, and presumably all the languages found to the north-east of these also belong to the Northern Athapaskan phylum.<sup>78</sup> Sapir hypothesized that the Athapaskan language family is part of a larger language phylum which he called Na-Dene.<sup>79</sup> The history of First Nation people in North America was highly influenced by the arrival of the white people. It is fair to state that the initial clash between the native people and white people had a devastating, often lethal effect for most of the aboriginal cultures. European colonialists killed about 50 million indigenous people between 1795 to 1945 worldwide.<sup>80</sup> Bodley also claims rightfully that the colonial encounter was not only a human but also a cultural disaster.<sup>81</sup>

Colonialism was the first phase of a dramatic world-wide cultural transformation that produced a single global-scale culture based on the commercial market economy.

Nevertheless, the arrival of Europeans in the subarctic region also brought new technology, schools and economic opportunities. The native First Nation of Canada's subarctic region were traditionally caribou hunters. The caribou was the most important source for food, clothing etc. The Dene people followed the caribou migration routes. This is exemplified by the term *edagha* 'a narrow place or area in the lake where the caribous are accustomed to cross and where people sit a little way above (referring to the current) to wait for them'. Moreover, and importantly, following the caribou determined and structured the seasonal cycle and socioterritorial organization.<sup>82</sup> The Dene Chipewyan culture was strongly in-

<sup>74</sup>Ejipo, by contrast, has been very isolated until the 1970s, as we shall explain in section 2.4.

<sup>75</sup>Sarsi, Beaver, Slavey, Dogrib and all the languages occurring north-east of these also belong to the Northern Athapaskan phylum.

<sup>76</sup>Malotki 1979, Malotki 1983.

<sup>77</sup>Assumed to be located between Athapaskan and Tlingit; Hoijer 1946, 11.

<sup>78</sup>Hoijer 1946; K. Rice 1989, 11.

<sup>79</sup>Including Tlingit and Haida; Sapir 1915, 12, Hoijer 1946.

<sup>80</sup>Bodley 1999, 465.

<sup>81</sup>Bodley 1999, 465.

<sup>82</sup>Smith 1981, 273.

fluenced by the Canadian Hudson Bay company<sup>83</sup> and the widespread settlement of white people during the Gold Rush years.

Historically, the Dene people lived in family groups on lands encompassing roughly 150.000 square kilometers. They were apparently a mobile people of hunter-gatherers who maintained both summer (-*sine*, *ziné*) and winter (*háye*) camps, traveling between them on foot or with dog teams. This aspect is important since building a tent (*bét'asi* 'outside of the house, tent') or trap while traveling or following big game (see below) depended on the actual material resources of the particular place.

After the signing of Treaty (or Contract) Six in 1876, many families worked on their reserve farms in summer raising cattle and horses. In winter, they continued to travel north to hunt, trap, and fish. In the early 1950s, the Federal Government turned the traditional Dene Chipewyan territory into an aerial weapons range.<sup>84</sup> It is important to note that the people lost access to their lands and hunting and fishing grounds. Moreover, they were relocated to three small reserves near Cold Lake totaling approximately 18.720 hectares in size (as opposed to 150,000 hectares previously).

Although the Dene people live partly in their original habitat (around Cold Lake), the historical hunting grounds are off limits. The Canadian government bases its largest air military base on the former hunting territory of the Dene. This simply means that Dene people can no longer use their old hunting and spiritual grounds, or family locations of the ancestors. A map measuring 3 × 4 meters at the Cold Lake reserve (band house) actually shows the degree and dimension of the former grounds.

This map indicates every band member, band family etc. and their origin, i.e., it shows that every place or location in Cold Lake once had a human place holder. This topology of names is similar to the topology of names that the Eipo have in their mountainous environment (see below).

Additionally to the military base, the world's second largest oil sands is situated around Cold Lake, meaning that the territory is off limits for the Dene people. Not much is visually left in terms of native traditions in Cold Lake and the village is similar to most other West Canadian villages or small cities, i.e., it is dominated by the fast food stores such as 'Subway', 'McDonald's', grocery stores, and shopping malls etc. typical of North American villages, towns and cities. Hence, Cold Lake is merely a Western Canadian town located in Alberta far away from the next large city (Edmonton) and dominated by Western culture. Dene people speak primarily English and the younger people in particular strive to simply assimilate to the white Canadians in terms of job opportunities or education. The idea of language, and hence cultural preservation, is of lesser importance for the daily life of the Dene.

A general problem with elder speakers of Dene is that some of them simply refuse to speak Dene even though their language is not officially discriminated against today. This is due to the painful past with respect to their treatment in the boarding schools where speaking Dene was prohibited. This led also to complete reluctance to speak Dene at home. The result is that the next generation (aged 45 to 55) were already crucially affected by language attri-

---

<sup>83</sup>One of the oldest companies in the world, established in 1670; mainly trading fur in British colonies of North-America; see the Hudson Bay Company Archive for further information; <http://www.gov.mb.ca/chc/archives/hbca/>.

<sup>84</sup>Named the 'Canadian Forces Cold Lake'.

tion, not to mention the young generation today.<sup>85</sup> As such, Dene presents an interesting, but difficult language and culture where one has to dig deep to obtain an idea of the culture and the practices of the speakers in terms of traditional habits and their history. Some of those traditional habits have survived through oral history. In particular older people remember various hunting techniques or the different functions of traps. On a daily basis this knowledge is not important anymore since their traditional way of life has changed so drastically. It should be pointed out that the future of Dene, or rather, the Cold Lake dialect, seems very bleak. In fact, this chapter is an attempt to glimpse into the intricacies of the interplay of culture, rituals, habits, and language in Dene. It is also an attempt to capture some of the spatial knowledge as long as it is available.

### 2.3.2 Material culture and subsistence techniques

The aboriginal inhabitants of what is now northeast British Columbia are the inheritors of one of the purest forms of hunting economy; purest in the sense that they are peoples who are flexible in the face of every changing circumstance, to whom material possessions are more of a hindrance than a help, and whose skills and mobility secured a life of relative affluence and good health as long as they could hunt successfully.<sup>86</sup>

The introductory quote indicates the importance of flexibility in the Dene culture in which hunting was the main source of survival. Dene Chipewyan people were mainly Caribou hunters and the most important food animals were the caribou *ethén* of the northern transitional forest and the tundra. Moose and woodland caribou were also important for survival. Generally, caribou were concentrated during their migrations between winter and summer, and in other times scattered at small groups. These behavioral characteristics often determined the manner in which the animals were hunted. The extent to which the migration of the caribou structured the Dene's life is indicated by specific expressions in their language. An example is the classificatory verb stem<sup>87</sup> for the caribou arriving, i.e., *ethén niltah* 'arrive' as opposed to *-tl'ah* which is the verb stem used for caribou only, as in *The caribou arrived*. The semantic difference is in the momentaneous resultative act of arriving as opposed to the telic end result of the arrival indicated by the perfective form. Another specification is the process of the caribou's return as in *ethén nahéltah* 'return' (only used for caribou) *The caribou returned*. It is apparent that knowledge of the caribou's location has been vital for the Dene since the caribou migration structured the Dene people's seasonal distribution, socioterritorial organization, and technology.<sup>88</sup> The caribou are also a key element of religious beliefs and oral literature.

The Dene people used the chute and pound method during the migration phase. A number of people and dogs circularly enclosed an area with a circumference of up to a mile or more containing the caribou herd, using a variety of snares (traps) fastened to poles or tree stumps. The construction of a snare or a deadfall is a highly sophisticated technology. However, it does not require a sound understanding of fundamental principles of physics, but

---

<sup>85</sup>Thiering 2009b.

<sup>86</sup>Brody 1982, 85.

<sup>87</sup>For the specific linguistic terminology, see below.

<sup>88</sup>Smith 1981, 273.

rather the behavioral characteristics of the particular species. Indeed, it is practical knowledge transmitted from one generation to the next that enables such techniques. Their material components are largely comprised of materials which can be found scattered across the boreal forest landscape. Dene deadfalls were used mainly for *tha* ‘marten’, *thachogh* ‘fisher’, *thelchuzi* ‘mink’, *nágidhi* ‘fox’, *sas* ‘bear’ (*dlézi* ‘grizzly bear’, *sas delgai* ‘polar bear’, *sas delzeni* ‘black bear’), *nábie* ‘otter’, *dzen* ‘muskrat’, *tsá* ‘beaver’, and *nághai* ‘wolverine’. Snares were set chiefly for grouse, hare, fox, bear, caribou, and moose. Hence, different techniques were required for different animals. Since caribou were the most important animal, the methods of hunting them will be specified as an example.

Once a caribou herd was detected the caribou were manoeuvred into the mouth of a prepared chute and driven to the pound. Once inside the pound the caribou were entangled by snares or traps. In addition, single caribou were hunted with spears or shot with arrows. Knowing the caribou tracks, another option was simply spearing them while they crossed the rivers and lakes. Hence, it was important to know the specific water conditions or the respective river as linguistically represented in expressions such as *des dánét?á* ‘the river is full’ or *des héli náltthah* ‘the river is flowing fast’. Both expressions were important for fishing and for locating caribou. Hunting techniques were adapted with respect to the behavioral characteristics of the animals. Big game use rivers or lakes for their water supply. Of course, since the arrival of white men, rifles were used more frequently. Unlike caribou, moose do not gather in larger herds, but tend to live in isolation. After eating the moose turns back on its trail to the windward to rest. Hunters adapted to this habit. They followed the trail to one side and windward, checking every once in a while whether the animal had returned. When this was the case, the hunter knew the moose’s exact location. Beside caribou and moose, bears were also hunted, but only occasionally. Beaver, on the other hand, were an important food source. Usually they were caught during winter when their homes could easily be located. The ice conditions limited the beaver’s movements. The idea of catching beaver was simple: it was sufficient to block the entrance and then break into their lodge. A variety of traps were used such as tossing-pole, springpole, stationary snare, deadfalls of various sizes and trigger mechanisms, bows and arrows.<sup>89</sup> Snares were used to catch hare. Only after European contact began were small mammals hunted or trapped solely for their fur.

The dog was the only domesticated animal used for hunting moose, bear, beaver, and geese. Fishing was an important food source only for some clans. In general, big game like caribou was sufficient. Seasonal climatic conditions in conjunction with the behavioral characteristics of the fish indicated the appropriate seasons of exploitation and the techniques to be employed to hunt them. Trout were taken by hook in open water or through ice holes in late winter. Fish spears were also used. Fishnets were usually made of willow or babiche in prehistoric times, while industrially produced twines and nets were introduced after European contact.

With the approach of fall, people left the summer gathering centers to seek food in preparation for the long and rather cold winter. People carried little with them, because many things could be made relatively quickly with local materials at hand. Although the land required unique skills to survive, these skills did not require a highly specialized manufacturing technology in order to act within the environment (the exception was making

<sup>89</sup>Bows were made of birch; strings were of twisted babiche, rawhide, or sinew. Arrows were made of straight-grained spruce or birch.

traps). This is not to say that indigenous technology was not sophisticated – quite the opposite, it was extremely complex, but its production did not require specialized labour. Most people could make most things used in the society. Indigenous people of the North accommodated to the sense of balanced needs with respect to what was available to them locally within their environment. They did not need many things in order to make a living. Their inventory of plants used for food and other material purposes was extensive.

### 2.3.3 Social structures

Regional bands ranged in size from about 200 to 300 people. Local bands varied from 30 to 100 people and their movements were again based on the migration of the herds. Shift of families was common and hence the bands became amalgamated and heterogenous. It can be assumed also that dialects changed or intermingled.<sup>90</sup> Most families were related to each other. Band membership was known to be fluid, i.e., bilateral kinship and marriage provided avenues for new affiliations.<sup>91</sup> Due to European-introduced diseases, substantial social realignments occurred. Smallpox, tuberculosis and influenza affected the Dene people in the 1920s.<sup>92</sup>

After 1945, most children were sent to Catholic residential schools off the reserve to receive a Euro-Canadian education. The entire community was adversely affected by the almost total separation of the family unit, which persisted except for the few weeks each year when children returned to their families. Elders and children lost the ability to communicate with one another. These schools had an especially devastating effect on the Dene language<sup>93</sup> and way of life, not only because children were discouraged from or actively punished for speaking their native tongue in these schools, but also normal linguistic and cultural transmission between the generations was vastly disrupted.

This is quite different from the Eipo situation, as will be outlined below. In Eipo, strong family and community bonds have been maintained and hence a detailed topography of their environment is still known. Parallel to the linguistic loss in Dene went the loss of songs, games, rituals, stories, techniques, e.g., practical knowledge of how to build the highly complicated traps, and ceremonies. All in all this implies an almost complete loss of community life and culture. The last 50 years have seen a steady decline in the numbers of Dene Chipewyan at Cold Lake able to fully communicate in their heritage language.<sup>94</sup>

A 1998 survey carried out in accordance with the Department of Indian and Northern Affairs Registration System identified 285 persons.<sup>95</sup> At present the number is down to about 200 speakers; fluent or conversant speakers of Dene Chipewyan out of an official band membership of 1,908. Thus, only about 10% of all band members speak an Aboriginal language to some degree of competency. The 1960s must have been traumatic for the Caribou Eater Chipewyan people since their contact-traditional way of life changed drastically and suddenly. The five bands, which were named after geographic areas, were relocated,

---

<sup>90</sup>As in Eipo; see below.

<sup>91</sup>Smith 1981, 276.

<sup>92</sup>Smith 1981, 274.

<sup>93</sup>Thiering 2009b; Thiering 2010

<sup>94</sup>Thiering 2009a.

<sup>95</sup>[http://jan.ucc.nau.edu/~jar/ILAC/ILAC\\_10.pdf](http://jan.ucc.nau.edu/~jar/ILAC/ILAC_10.pdf); accessed 25 February 2014. For an earlier census, see Smith's table of Chipewyan population in 1970: Smith 1981, 75.

e.g., to a subarctic town notorious as one of Canada's worst slums.<sup>96</sup> The result of this relocation had a devastating effect on the people and left them disoriented and demoralized.<sup>97</sup> The imposed village life profoundly changed the traditional living habits of the hunter-and-gatherer culture. Men were supposed to leave families behind while hunting, i.e., the former division of labor was disrupted. The distance from the village to the hunting grounds made it difficult to kill a large number of animals simply because only a limited amount of meat could be transported by a dog team.<sup>98</sup>

#### 2.3.4 Traditional religion

Myths about places, rituals and used objects, powers, spiritual and medical knowledge, stories, dances and music were religious. Hunting and gathering were the most important activities for survival, and spirituality was linked to finding food and was important for survival in the harsh climatic conditions. Hence, spirits were thanked for when finding food. If no food was found the Dene people tried to appease the spirits with offerings. One important spiritual figure was the *Kakhani*, a supernatural being, half-man and half-monster. It was believed to steal children. Unlike the Eipo, who did not decorate most of their tools, not even objects like the holy digging-stick (see below), Dene people decorated their snowshoes with paint, strings of shells, and amulets woven into the snowshoe to keep the wearer safe from unfriendly spirits.

#### 2.3.5 Physical environment

The environment of the Dene Chipewyan people is made up of tundra, forest (black spruce, white spruce, birch, aspen, also known as the 'land of the little sticks'), and boreal forest. The seasons are basically bicyclic: long and severe winters, short and moderately warm summers. The severe winters limited activities and required maximal effort for survival. Variation in snow conditions affected the behavior of the fauna (providing food and clothing) and hence affected native techniques for its exploitation. During summer, traveling was on foot, following water courses or by canoe on open water. Around late autumn (September/October) water began to freeze, which limited traveling. In winter, dog sleds and snowshoes were used. Game animals provided most of the raw materials, e.g., bones, antlers, hide (skin) to produce beamers, needles, spear, arrowheads, fishhooks, bowstrings, fishing lines, bags, lodge coverings. The forest (forest-tundra) provided most of the remaining raw materials for bows, arrows and spear shafts, containers, dishes, net gauges, snowshoe, and canoe frames, snow shovels, toboggans, bark for making dishes, boxes, and coverings for lodges and canoes.

Generally, the climate was a dominant and active element in the subarctic environment. This region belongs to the cold snow forest category, a circumstance which profoundly affects the life circle of the Dene people. Rivers and lakes played an important role in transportation and communication. The drainage grids and water surfaces were important movement and communication routes and therefore attracted settlement and other activities

<sup>96</sup>The five regional bands are: Duck Lake/Churchill band ('east people'), Barren Lands band ('flat-area-dwelling people'), Hatchet Lake band ('hatchet-lake people'), Black Lake band ('upland or western people'), and Fond du Lac band ('pine-house people').

<sup>97</sup>Smith 1981, 282.

<sup>98</sup>Smith 1981, 282.

during both winter and summer. In addition, knowing the game routes, e.g., along rivers, helped in finding enough food for the band. The richness of fish, lumber, and wood pulp attracted white enterprises, particularly the Hudson Bay Company. This, of course, changed the life habits of the Dene people as well.

### 2.3.6 Relationships to neighboring groups

The only known enemies were the Cree to the south and the Inuit to the north. The landscape features forming the borders were not crossed by the Dene except for warfare. Regarding contact to the Europeans, at the beginning the marginal location to the transportation and trade routes, the dependence on caribou, and the low interest in European trade goods led to a rather slow and limited sociocultural change.<sup>99</sup> Rapid changes only began in the 1960s. Hence, no relationships with Europeans were established until the 1960s.

### 2.3.7 Linguistic overview

It should be noted that for reasons of history and migration, the Dene band is the most southerly of all Dene Chipewyan-speaking communities in Canada and is geographically isolated from other Dene Chipewyan speech communities. Consequently, the dialect spoken at Cold Lake is particularly conservative and rich in phonological and lexical contrasts that have been lost in more northern dialects. Indeed, many Cold Lake Dene speakers regard their dialect with pride as the purest form of Dene Chipewyan (whatever is left of their language).

Dene features a polysynthetic linguistic system, i.e., bound morphemes constitute complex words or even sentences and the syntactic object of the sentence is incorporated into what may be termed the verb cohort. The general encoding pattern in Dene indicates that the language features a predominant and consistent classificatory verb system including directional prefixes as well as a postpositional inventory creating relational predication cohorts or constructions.<sup>100</sup> Such verbs have different morphological forms depending on the object to be encoded. Cook argues that Dene has about 36 postpositions that morphologically behave like nouns. They inflect with pronominal prefixes.<sup>101</sup> Cook also highlights the fact that the determination of a postposition's meaning is as notoriously difficult in Dene as in English or any other language, making it often impossible to determine the precise meaning out of context. However, these postpositional prefixes are widely acknowledged as modifying the meaning of the verb stem.<sup>102</sup> Their stems change depending on the shape, animacy, and/or physical features of the object being located or handled.<sup>103</sup>

The general focus of this chapter is on the formation of certain semantic construction types and the encoding of the figure-ground asymmetry as modified by the linguistic construction. The language features a predominant classificatory verb system, as do all of the other languages of the same phylum.

All the Athapaskan languages exhibit an alternation of verb themes that is traditionally called classificatory. The classificatory themes describe the nature of

<sup>99</sup>Smith 1981, 282.

<sup>100</sup>See Li 1946, Kari 1979, Cook 2004b, K. Rice 1989, McDonough 2000, S. Rice 2002 on the general structure of the Athapaskan verb stem system.

<sup>101</sup>Cook 2004a, 92.

<sup>102</sup>S. Rice 1996.

<sup>103</sup>S. Rice 2002, 69.

an object handled with respect to parameters such as extension and dimension. The verb theme indicates the nature of the object handled, while the type of activity involved is expressed in the prefixes.<sup>104</sup>

The choice of a particular verb stem from the appropriate set of verb stems has the effect of assigning to the noun of the sentence certain qualities of number, shape, texture, or purpose. If these qualities are semantically inappropriate to the noun, another verb stem must be used.<sup>105</sup>

These stems profile existential situations or actions of certain categories of objects.<sup>106</sup> Table 2.1 summarizes the four main classificatory verb types used in Dene.<sup>107</sup>

Posture or locative verbs	no movement involved: e.g., ‘sit’, ‘stand’, ‘lie’, ‘be in position/location’
Verbs of handling, manipulation, continuing manual contact	e.g., ‘give’, ‘hand’, ‘take’, ‘put’, ‘handle’, ‘bring’, ‘carry’
Verbs of partially controlled action (+ agent)	e.g., ‘toss’, ‘throw’, ‘hang up’, ‘set down’, ‘drop’, ‘lose’, ‘push over’
Verbs of free movement, independent of agent	e.g., ‘fall/tip over’

Table 2.1: The different classificatory verb types

According to traditional accounts, the Dene verb consists of a verb theme (the basic lexical entry made up of a stem and one or more thematic prefixes; a unit including a verb base plus other morphemes combining to a specific meaning construction); and additional prefixes.<sup>108</sup> The Dene verb construction can be described as a composite construction similar to Navajo.<sup>109</sup> It is claimed here that the Dene verb system is compiled via a string of distinctive elements fused or agglutinated together to form a lexical unit or word, or a sentence. The verb stem is the basic entry or atom derived from a verbal root. The theme profiles the verb base (classifier plus stem construction), i.e., a skeleton of a meaningful lexical unit.<sup>110</sup> The verb stem is assumed to be the content part of the verb, and contains rich semantic information.

The Dene verb shows polysynthetic and fusional characteristics in its morphology and with its rich prefix system.<sup>111</sup> Subject and object prefixes are fused within the verb.<sup>112</sup> These prefixes encode also five modes, and three aspectual forms, person, and number.<sup>113</sup>

<sup>104</sup>K. Rice 1989, 779. The concept of ‘verb theme’ is explained below.

<sup>105</sup>Carter 1976, 24.

<sup>106</sup>Davidson, Elford, and Hoijer 1963; see Senft 2000 on a collection of papers on classification.

<sup>107</sup>Davidson, Elford, and Hoijer 1963, K. Rice 1989, S. Rice 1997, S. Rice 2002, Cook 2004a.

<sup>108</sup>Li 1946, Hoijer 1951, Young and Morgan 1987, K. Rice 1989.

<sup>109</sup>Young and Morgan 1987, Young and Morgan 1992.

<sup>110</sup>Young and Morgan 1987, 99.

<sup>111</sup>Buschmann 1855, Morice 1890, Li 1946, Boas 1977.

<sup>112</sup>S. Rice 2002, 66 ff. Cook 2004a.

<sup>113</sup>The five modes are: the neuter, momentaneous, continuative, customary, and the progressive mode; the three aspectual forms are: the imperfective, perfective, and future aspect; see Li 1946, 404, 409.

The neuter verb refers to the state or the position of the figure. The momentaneous profiles a rapid action or transition from one state to another as in ‘to sit down’, ‘to handle a round solid object’ or ‘to lie down’. The continuative verb profiles an activity that lasts in time such as ‘to stay’ or ‘to own’. The customary verb encodes a repeated action and the progressive encodes an ongoing action.<sup>114</sup> Themes occur as free and bound lexical units. Free themes profile nouns and modifiers, bound themes are verbs and pronouns.<sup>115</sup>

To show the verb stem changes according to the figure to be encoded, an example of stem variation is given in table 2.2. It is evident that different objects to be handed over or handled affect and change the verb stem, i.e., the morphology.<sup>116</sup>

<i>be(3SG.)-gha(to)-n(MOM)- i(1SG.S)-l(CLASS)-ti(STEM)</i>	‘I gave animate being to him/her.’
<i>be-gha-n-i- ?a</i>	‘I gave round/hard object to him/her.’
<i>be-gha-n-i- ta</i>	‘I gave sticklike object to him/her.’
<i>be-gha-n-i-l-chudh</i>	‘I gave flat object to him/her.’
<i>be-gha-n-i-la</i>	‘I gave plural objects to him/her.’
<i>be-gha-n-i-ka</i>	‘I gave open container to him/her.’
<i>be-gha-n-i-chu</i>	‘I gave unspecified object to him/her.’

Table 2.2: Variations on the theme ‘I transferred X to him/her’

The Dene verb stem changes according to the quality of the figure, i.e., differences in shape, size and animacy of the objects to be encoded determine the choice of a verb’s stem.

In the literature on Athapaskan languages it is common to use rather idealized templates as presented above. The number of prefixes varies significantly, e.g., Athna has 23 prefix positions,<sup>117</sup> Slavey 14,<sup>118</sup> and Navajo 10.<sup>119</sup> McDonough divides the verbal complex into a bipartite structure: Positions 1 to 4 are the satellites, and positions 5 to 10 are defined as the pre-stem position.<sup>120</sup> The positions (1 to 4) (= disjunctive prefixes) and (5 and 6) (= pronominal subjects/objects) are part of the disjunct or lexical zone and largely have a derivational function, while positions (7 to 10) are called conjunct or grammatical zone and include obligatory inflectional categories such as tense, aspect, modality, subject agreement, or valency.<sup>121</sup> Valency classifiers in position 10 indicate the transitivity and voice of the verb, i.e., whether the subject takes a direct object or not. With regard to the data description, the stem plus the positions 8 to 10 as well as 1 are of primary importance.

We have seen some important aspects of the Dene culture and language. The next section presents some background on the anthropological and linguistic aspects in Eipo.

<sup>114</sup>Li 1946, 405.

<sup>115</sup>Hoijer 1946, 297.

<sup>116</sup>For the linguistic abbreviations, please consult table 2.13, preceding the Bibliography. Here and in the following, the question mark (?) denotes a glottal stop sound in Dene.

<sup>117</sup>Kari 1979.

<sup>118</sup>K. Rice 1989.

<sup>119</sup>Young and Morgan 1987, Young and Morgan 1992.

<sup>120</sup>McDonough 2000.

<sup>121</sup>Li 1946, 409.

## 2.4 Anthropological and linguistic background: Eipo

The Eipo language and culture are members of the Mek group of Trans-New-Guinea-Highland Papuan languages and cultures.<sup>122</sup> The Eipo live at the northern slope of the central cordillera in the valley of the Eipomek River in the central Mek region. (*Mek* is the term for water and river in the Eipo dialect of the Mek languages and was therefore chosen as denominator for this ethnolinguistic group,<sup>123</sup> other dialects use *mak* or *me*.<sup>124</sup>) The Eipo territory is located approximately at a longitude of 140 degrees east and a latitude of 27 degrees south in what is now called *Kabupaten Pegunungan Bintang*, the ‘Star Mountains District’ of the Indonesian Province of Papua (formerly Irian Jaya). Thus, Eipo belongs to an estimated number of 760 Papuan languages of about 4 to 5 million speakers divided up into sixty language families.<sup>125</sup> Foley presents a comprehensive overview of the Papuan phylum, its location and its historical background.<sup>126</sup> An important aspect, as Foley points out, is that according to his analysis, Papuan languages are not genetically related, i.e., they do not trace their origin back to a single ancestral language.<sup>127</sup>

Quite unlike the Dene, the Eipo preserved most aspects of their way of living until the mid-1970s, when two major earthquakes hit their region and they began to convert to Christianity. The typical Eipo community consisted of hamlets of 35 to 200 people that are settled at around 1,300 to 2,000 m above sea level, but the Eipo hunting area extends up to 4,000 m above sea level. These numbers are compatible with Foley’s account according to which New Guinea societies are based on hamlets between 100 and 300 people.<sup>128</sup> His explanation for the small size is that ecological conditions, especially the difficult terrain, prevent people from moving across barriers (see below).

However, Eipo women and men, also children, cross the high mountains frequently and a number of men report having even climbed from their village at 1,700 m to the pass at 3,700 m, i.e. 2,000 m altitude, in darkness. These extraordinary feats usually happened in clear nights with a good moon, but are still a most remarkable performance given that the path is often hardly visible even in bright daylight and that a wrong step could cause death on many of the perilous tracks to be negotiated. These reports and Schiefenhövel’s personal experiences of walking long distances at high altitude with Eipo friends demonstrate that they, like other highland Papuans, are adapted to their environment with a perfection foreigners can hardly fathom.

The Mek share some cultural features with their neighbors in the east and in the west.<sup>129</sup> The term *mek*, as mentioned above, stands for ‘water’, ‘river’, ‘brook’, also for ‘sweat’ and other semantic units, generally for watery liquids (3894).<sup>130</sup>

<sup>122</sup>Wurm 1982.

<sup>123</sup>Schiefenhövel 1976, Schiefenhövel 1979, Heeschen and Schiefenhövel 1983, Heeschen 1990, Eibl-Eibesfeldt, Schiefenhövel, and Heeschen 1991, Schiefenhövel 1991, Heeschen 1998.

<sup>124</sup>See also Louwerse 1978 and Louwerse 1988.

<sup>125</sup>Wurm 1982, Foley 1986, Bußmann 2008.

<sup>126</sup>Wurm 1982, Foley 1986.

<sup>127</sup>Foley 1986, 3; but see Heeschen 1992 who argues for the genetic relatedness of all Highland Papuan languages.

<sup>128</sup>Foley 1986, 14.

<sup>129</sup>The Mountain Ok in the east (cf. Pouver 1964) and the Yali, a subgroup of the Dani, in the west (Koch 1984).

<sup>130</sup>Arabic numbers in parenthesis refer to the entry in the unpublished File Maker corpus of Eipo held at the Max Planck Institute for the History of Science. It is based on the dictionary of Eipo which not only contains words and their translations into German and English, but also features quotes of actually spoken phrases, sections of legends, songs etc. (Heeschen and Schiefenhövel 1983). Those entries exemplify the Eipo terms, with the result that the

*Mek* was an obvious local word to be used as ethnonym to designate the cultures and languages in the Mek area. The relationships between the groups in this region and their linguistic and cultural unity were unknown to the local people until 1975.<sup>131</sup> The Eipo River or Eipomek is the main river of the area where Eipo was spoken by approximately 800 people at the beginning of fieldwork in 1974. The total number of Mek speakers north and south the central range may have been around 15,000 at that time. The number of speakers had risen to at least double this figure in 2009.

Other dialects in the Eipo area were spoken by an additional number of around 700 persons, so that, at the beginning of research in 1974, about 1,500 speakers of Eipo and related dialects lived in the area. As noted above, the villages had between 35 and 200 inhabitants. This figure has also risen greatly due to the dramatic population growth typical of the highlands as well as the other regions in Papua Province and, on the other side of the border, in Papua New Guinea, where the annual percent population surplus is estimated at 1.89% for 2013,<sup>132</sup> other estimates derived from studies in the first years of wide-ranging acculturation place this figure between 2.1%–2.6%.<sup>133</sup> In the past, village communities and political alliances were rather small, following a pattern which was found in many New Guinea Highland Societies, except where wide valleys had brought about a different settlement pattern, e.g., the Balim Valley in the Province of Papua and the Whagi Valley of Papua New Guinea, where much larger populations lived.

The phrases in table 2.3 present the importance of the rivers and similar features (*mek*) as landmarks and origin of mental concepts and metaphors in the Eipo language. (Numerous other semantic usages of *mek*, that do not refer to spatial deixis, have been left out.)

Eipo speakers base their directional system on the river stream system.<sup>134</sup> The spatial terms *ou* ‘down the river’, *or* ‘across the river on same level or below one’s own position’, *ei* ‘up the river’, *er* ‘across the river above one’s own position’, and others are river based. Also, as indicated in the list above, many metaphors use river and water as *tertium comperationis*, as in *mek-arye* ‘steam’ and *mek kate* ‘ice’. In addition, some shape forms are based on the morphem *mek*, e.g., the bowl-shaped form that results from water washing out a certain spot, or a cavity made by water (*mek loktena*).

With respect to natural boundaries it has to be mentioned that it is difficult but usually possible to find ways through the rainforest adjacent to the inhabited areas like those in the Mek region, as well in the montane and alpine regions of New Guinea. The swampland present in some lower altitudes poses greater problems for human mobility and has probably contributed to the very marked cultural and linguistic diversity for which New Guinea is known. As Foley states, the terrain thus poses some genuine barriers to human social interactions and would certainly favor linguistic diversity.<sup>135</sup> It seems likely that the extraordinary variety of languages and cultures in this part of the world is also the product of an aggressive (warrior-like) attitude of one group toward another, even inhabitants of one valley toward the neighboring one. Intergroup warfare increases intragroup cohesion and

---

monograph is more an ethnographic wordbook than a mere dictionary. These entries were transformed into the above-mentioned electronic data file. Additionally, examples of Heeschén’s substantial *Ethnographic Grammar of the Eipo Language* (Heeschén 1998) and field notes of Wulf Schiefenhövel are used in this chapter.

<sup>131</sup> Schiefenhövel 1976.

<sup>132</sup> [http://www.indexmundi.com/papua\\_new\\_guinea/population\\_growth\\_rate.html](http://www.indexmundi.com/papua_new_guinea/population_growth_rate.html), accessed 6 December 2013.

<sup>133</sup> King and Bathgate s.d.

<sup>134</sup> See Brown 1983.

<sup>135</sup> Foley 1986, 9.

is very likely to have led, in a process of character enhancement, to the very fragmented cultural and linguistic scene typical for mainland and island New Guinea.<sup>136</sup>

---

<i>mek burwe</i>	‘head water region’
<i>mek youkwetam</i>	‘downstream’ (3894/31), ‘toward the foothills’, ‘north’
<i>mek bongbong</i>	‘(narrow) valley’
<i>mek arum</i>	‘water surface’ (191/1)
<i>mek lu</i>	‘water surface’ (3623/2) ( <i>lu</i> = ‘even’, ‘flat’, ‘down’, ‘low’)
<i>mek amwe</i>	‘bed/bottom of a river, a lake’
<i>meke ebrarik</i>	‘water’, ‘rivers split up/join’, ‘river junction’
<i>mek bene</i>	‘stagnant water’, ‘swamp’
<i>sisilya arang mek</i>	‘reddish brown water (e.g. coming from swamps)’
<i>mek kwen</i>	‘lake’, ‘pond’
<i>mek bun</i>	‘bridge’ (936)
<i>mek dala</i>	‘river bank’ (3894)
<i>mek denemna</i>	‘border of a brook’
<i>mek duman</i>	‘the river shore, along the river’: cf. <i>Eipodumanang</i> ‘we are the ones who live at the shore of the Eipo River (the Eipo)’
<i>mek irikna</i>	‘river bank’ or ‘edge of a river’ (2220/1)
<i>mek deya</i>	‘hollowed out river bank’ (3894/6)
<i>mek dorobna</i>	‘small spring’
<i>mek lum</i>	‘waterfall’, lit.: ‘water veil’ (3894/8)
<i>mek ib</i>	‘to dam a water’ (3894/10)
<i>mek kate</i>	‘ice’, lit.: ‘hard water’ (2427/9)
<i>mek loktena</i>	‘hollow/cavity made by the water’ (3575)
<i>mek-arye</i>	‘that which is caused by water’, ‘steam’
<i>mek burbur annal</i>	‘the river swells up’
<i>moke wik meke</i>	‘when there is a lot of rain the rivers swell up’
<i>bo’lunmak</i>	
<i>wakna mek</i>	‘actual course of the water’ (3446/2) (as opposed to <i>wakal kwoten mek</i> ‘old river bed’ (5439))
<i>mekin bal</i>	‘(mythological) snake (which created the land by damming and derouting the water)’
<i>basam mek</i>	‘water from sacred ponds which pigs should drink to grow faster’
<i>beta mekduman</i>	‘(the ancestor) walked the whole way along the river’
<i>mereklamuk</i>	
<i>mek aleng</i>	‘the stringbag which people put over their eyes when they commit suicide by jumping into the river’

---

Table 2.3: Semantic variation of ‘river’ in Eipo

<sup>136</sup>Schiefenhövel 2001.

The data suggest that the process of pseudospeciation so typical for New Guinea with its many hundred ethnolinguistic groups set in motion not only by the long history of settlement and the rugged nature of the terrain, but also by the above-mentioned high level of aggression between the groups, thus by a biopsychological factor. Linguistic markers of ethnic identity and the dynamism of languages developing away from a common origin play, of course, an important role in this process as well. Foley's hypothesis may be true for the inundated or swampy sections of the lowlands, but one can safely say that neither very high mountain ranges of close to 4,000 m altitude nor large rivers (like the Idenburg-Mamberamo system north of the Mek area) have kept people from moving across those 'borders'. This is in contrast to what Europeans would assume in view of these formidable barriers.

Our species is an extremely mobile one, as proven by the fact that the ancestors of today's Papuans, after crossing the open ocean at the Wallace line between Bali and Lombok, arrived at the New Guinea coast some 50 to 60,000 years ago<sup>137</sup> and settled throughout the interior. Much later, Papuans, probably initially on the islands and coasts of the Bird's Head area in the westernmost part of New Guinea, mixed with people arriving from Southern China and/or Taiwan (the Protoaustralonesians). That Austronesian seafarers made their homes on almost all the islands in Melanesia, Micronesia and in the vast Polynesian Pacific long before James Cook arrived is a truly extraordinary feat of spatial orientation and human expansion across the inhospitable vastness of the Pacific Ocean.

#### 2.4.1 Contact history and recent acculturation

The Eipo were first contacted by members of the heroic crossing of West New Guinea, from the south to the north coast, by members of the expedition of Pierre Gaisseau (1961) in 1959, and in 1969 by a group of Indonesian military personnel including Gaisseau, who parachuted into the southern Eipomek Valley,<sup>138</sup> and stayed some weeks in this and the adjacent area in the east. They produced a small amount of good ethnographic and linguistic data and are still remembered by the local people. In the early 1970s a few missionaries of the Unevangelized Fields Mission (UFM) walked through the Tanime, Eipomek and Nalcemak Valleys to check possibilities of building mission stations.

When fieldwork of the interdisciplinary German research team<sup>139</sup> began in 1974 the Eipomek Valley did not have an airfield and a mission station. At that time, the Eipo therefore lived in marked isolation. Moreover, very few metal tools (bushknives, axes) and a few new plants (e.g. *Zea mays*, *Sechium edule*) had found their way into this area. Schiefenhövel's fieldwork<sup>140</sup> was mainly carried out in the village of Munggona, the cultural and religious center of the southern Eipomek Valley, but also included the neighboring valleys east and west, the Heime Valley south of the central range and regions at the northern fringe of the Mek culture near the Idenburgh River as well as the In Valley around Kosarek (where the westernmost Mek speakers live), and the until then uncontacted area inhabited by the Lauenang north of Kosarek.

In 1979 the inhabitants of the Eipomek Valley accepted Christianity. It is important to note that this acceptance was basically a political, not a religious decision. The Eipo had

<sup>137</sup>Swadling 1981.

<sup>138</sup>Komando Daerah Militer XVII "Cenderawasih" 1969.

<sup>139</sup>Funded by Deutsche Forschungsgemeinschaft.

<sup>140</sup>First period from 1974 to 1976; follow-up visits in 1979, 1980, 2008, 2009, 2010, 2012, 2013, 2014, 2015 and 2016.

realized that they had lived separated from the rest of the world with its astonishing superiority in material goods and technologies and wanted to become part of this world. As in other regions of Melanesia the new religion was seen to hold the promise to connect them to the hitherto almost completely unknown way of life. Until 2016 the strategy to accept Christianity as an avenue to the modern world has worked out well for them. Many Eipo go to school and are doing very well, and some of the young people are students of Cenderawasih University in the provincial capital of Jayapura or in other academic institutions of the Indonesian Republic, even in the capital Jakarta. These remarkable changes were all achieved within one generation. This radical change had, and still has, repercussions on the Eipo culture and language. Movements for religious revival, including the classic cargo-cult type millenarian prophecies, have not affected the Eipo yet. They have, indeed, so far opposed such utopian ideas. It seems they have understood that the only way to move forward and to secure their survival as a cultural and political group is to become as well educated as possible.

Many elements of their traditional lives have changed, but others have remained much the same as in 1974, partly because there is no road for any type of vehicle connecting their region with any of the centers of the province. Walking and the airplane will be the only means of transport for a long time to come.

One of the most dramatic changes in the political field concerns the fact that the Eipo and their neighbors have understood that they form a larger single ethnic group with the same Mek language and very similar cultural traditions and that they should cooperate in the arena of provincial politics. They have thus developed a new spatial-political concept, which is paralleled by their new, much widened horizon: quite a few of them travel by plane to Jayapura, the provincial capital on the north coast (about 200 km in a straight line or one and a half hours' flight time), and other cities, e.g. Wamena, the main hub of the highlands of Papua Province, and some Eipo have visited Germany and other European countries. Walking beyond the formerly rather confined borders of areas where relatives lived is also common now. Quite a number of Eipo, including middle-aged persons, walk to Oksibil, the government center in the east of the Mek region not far from the border with Papua New Guinea, and live there for a while, despite the fact that people in this region speak the Ok language which they do not understand. The lingua franca is Bahasa Indonesia which many Eipo speak quite fluently.<sup>141</sup> Most administrative posts are filled by persons of Papuan origin, including the governor of the province and the rector of the University in Jayapura-Abepura. Eipomek, the name of the airfield and the administrative seat of the upper Eipomek Valley, has a number of public service offices, but no one is working there yet.

#### 2.4.2 Material culture and subsistence techniques

Traditional tools were the *ya* 'stone adze', *kape* 'stone knife', *fa* 'bamboo knife', *kama* 'wooden digging stick', *yin* 'large bow', *mal* 'arrow', *aleng* 'string bags' (of various sizes), *towar* 'ratan liana' for binding and fire-sawing and some other, smaller tools plus a range of body decorations.<sup>142</sup> Subsistence techniques were a mix between horticulture, hunting and gathering. Highland New Guinea is the homeland of some important domesticated food plants and thereby one of the very few centers of early agriculture worldwide. Some of the

<sup>141</sup> *Ok* is the term for water and river in this part of the New Guinea highlands.

<sup>142</sup> For a complete inventory of their material culture, see Koch 1984.

main plants are the *am* ‘taro’ (*Colocasia esculenta*), *kuye* ‘sugar cane’ (*Saccharum officinarum*), *bace* a related plant eaten as a vegetable (*Saccharum edule*; *pitpit* in Neomelanesian Pidgin), some protein-rich leafy greens (*mula*, *Rungia klossii*; *towa*, *Abelmoschus manihot*) and probably also *kwalye* ‘banana’ (*Musa paradisiaca*) belong to these autochthonous foods. Various cultivars of sweet potato (*kwaning*, *Ipomoea batatas*), the arrival date of which (either after the conquista or through early Polynesian transpacific contacts) in New Guinea is still debated, provide the bulk of carbohydrate energy and thus comprise the staple diet. Hunting<sup>143</sup> is not very efficient, as the local species of marsupials<sup>144</sup> are small, yet it played an important role in providing essential amino acids and was held in high esteem by the men. Hunted game is still ritually important (to host special groups of guests, as part of the bride-price etc.). *Basam* ‘pig’ (*Sus scrofa*) and *kam* ‘dog’ (*Canis familiaris*) are placental, i.e. non-marsupial animals, possibly introduced by the Austronesians, and thus foreign to the ex-Sahul fauna typical for New Guinea and Australia with kangaroos, wallabies and the like. Dogs are not eaten by the Eipo, whereas the pig was, and still is, a very important source of protein and fat. As pigs are not able to find enough food themselves they are fed, usually sweet potato, and thus represent a luxury food reserved for special occasions. They continue to be very important for ceremonial exchange as well.

Horticulture provides the staple foods of the Eipo. Gardens (*wa*) were usually made in areas which had been cultivated before and allowed to lie fallow for approximately 15 years. This period was determined via a bioindicator: the growth of the *urye*-tree (*Trema tomentosa*). When it had reached a certain height and diameter the soil was seen to have recovered and to be ready for a new round of planting and harvesting. Fallow periods have been shortened for several years now due to the marked population increase and the need for more food. The garden land is owned by patrilineal families. Some clans, those said to have come later in the history of settlement, do not formally own land in the Eipomek Valley but are given plots to grow their food. In this way, there was, in normal situations, neither shortage of suitable land nor of garden produce. Everyone who was physically able to work in the garden could and still can do so and was and is able to provide food for him/herself and the family.

Garden land is sacrosanct. The individual plots are clearly identifiable: at the corners or other crucial spots of the garden’s border the sacred *yurye* (*Cordyline terminalis*) is planted. This is a small tree with often reddish, lancet-shaped leaves, of which several cultivars are known. It is also planted at other crucial places, e.g. near the sacred men’s house, at meeting places or at the head of the long cane bridges spanning roaring rivers. Interestingly, this particular plant signifies places of religious importance throughout the Pacific, e.g. the entrance of temples in Bali and holy sites in Polynesia.<sup>145</sup> The visual line connecting the *yurye* is the border (*wa wiliba*, literally: ‘the garden work-stopper’) in Eipo gardens. Failure to respect this border by clandestinely or openly transgressing and planting or harvesting in the land of one’s neighbor leads to serious conflict: verbal aggression and, possibly, physical fights. Everyone knows this law and usually respects it. There is, thus, family-owned, not communally owned garden land. The geometry of the gardens, their general shape, slope, geological condition and suitability for particular crops is common knowledge, as is

<sup>143</sup> With bow and arrow, often assisted by specially trained dogs or with snares and traps.

<sup>144</sup> Mice, rats, opossum-type animals of the *Phalangeridae* family.

<sup>145</sup> At this point it remains an open question whether the surprisingly wide distribution of this plant as a religious symbol is pure coincidence or the effect of cultural exchange.

the closer and wider area around the village which is represented by a complex network of place names.

When one walks on a path leading away from the village toward the periphery one crosses from zone to zone, all with defined borders, specific place names with their specific history of what happened there in mythical, remembered, and recent times. Known space is, thereby, meaningful territory, a carpet of culturally encoded signals, enriched with one's own experience, with emotionally and cognitively relevant contexts. Arguably, this might have been similar in any rural environment and in daily contact with its spatial and other features. It is at least similar to the Dene Chipewyan tradition.

### 2.4.3 Social structures

Patrilineal descent and virilocal residence, i.e., the wife moving to the husband's village, are still in place. The marked division of the society into female and male spheres (with men's houses and women's houses, both religiously meaningful, and other cultural institutions), which was present in the Eipo culture, as in that of other Papuan groups in the New Guinea highlands, has been reduced in recent years. Similar to other Papuan societies the leading roles in the public arena were, in the past, taken by the big men (*sisinang*, literally: 'the ones who speak'). They got these positions through a mix of personal characteristics, among which intelligence, vitality, rhetoric and social skills were the most important. This meritocratic system without heritable chieftainship controlled all public affairs, including the decision whether to wage war or make peace with the main enemy in the adjacent western Famek Valley. Today, new leading positions have become available, among them those of church leaders and teachers; incipient forms of election are becoming institutionalized. Clan exogamy was, and still is, the guiding principle for marriage. In the past, 12% of all men were, at one time in their lives, married to more than one, usually two, exceptionally three wives; this optional polygyny was largely abandoned with the acceptance of Christianity. Divorce was common; the woman usually took the separated couple's younger children with her, went back to her own family and usually remarried quickly.

### 2.4.4 Traditional religion

This section provides some ideas on the former animistic religion of the Eipo. Like that of the other highland New Guinean religions or, in fact, Melanesian religions in general, it was based on the belief that the visible and invisible world is filled with beings, i.e., *isa* 'spirits' of various kinds similar to the Dene Chipewyan tradition. Most important were creator spirits, e.g., the *Yaleenye*. Similarly powerful were the sacred pig and several female beings like the *kwaning fatane kil*, the 'spirit woman who is always hungry for food'. Some of them were thought to be still existent and active, interfering in people's lives. *Yaleenye* (literally: 'the one who comes from the east') and other 'creator gods', as one may call them, shaped the Earth, making its formerly swampy surface inhabitable by wedging stones into it and by planting sacred trees. Thereby, they created the kind of soil in which plants, especially food plants, could grow and on which people could live. They also formed the beds of the large and the small rivers and instructed the early people how to lead a proper life. They showed them how to make stone adzes from rocks in the Heime Valley, how to establish men's and women's houses and how to carry out ritual ceremonies.

One mythical account narrates how the first humans dug their way from underground to the surface with their foreheads. *Yaleenye* taught them how to transform their ugly, dirty faces by cleaning them with leaves and pig fat and decorating them with ochre, and thus how to become real humans with beautiful faces. Other *isa* were those of the animals (wild and domesticated), of rivers, conspicuous rocks, trees, certain places (like that of the sacred pig *kwemdina basam*), and of all the dead (*ise dib* ‘the true spirits’). These agencies dwelling in the different spheres close to or farther from the abode of humans were able to influence their life, the fertility of their gardens and other important aspects of livelihood. Diseases were thought to be caused either by one of these spirits or by harmful black magic (*kire*). Specific ceremonies (*kwetena*) to improve the condition of the sick person were carried out by male or female healers (*kwetenenang*) thought to be able to communicate with the spirit world. Sorcerers believed to have killed somebody were sometimes ‘divined’ by a seer (*asing ketenenang*, literally: ‘someone whose eyes are sharpened’) and then killed by the family of the deceased person.

Religion and secular life were not distinct, but essentially intertwined. Before dancers of the Heime Valley descended from the mountain pass to the village of their hosts, where they would carry out their rather spectacular dance performance,<sup>146</sup> they prayed to *Murkonye*, one of the powerful creator spirits, to make them shine and radiate with beauty and vitality. Moreover, during everyday actions, religious ceremonies were interconnected with what people did. If one were to chop down a tree with one’s stone adze, one would first carry out a ceremony designed to safeguard this procedure: the adze should not become damaged, one should remain unharmed and the tree should fall quickly into the right direction. When one approached a rock shelter in the high mountains one would address the spirit believed to dwell there to receive the human visitors kindly and to protect them from the harsh and dangerous surroundings.

#### 2.4.5 Physical environment

This section presents some information related to the local topography, and hence spatial coordinates as defined above that are of particular importance in this chapter. The Jayawijaya Mountains, the stretch of the central cordillera separating the northern and southern Mek groups are, like the rest of the Trans-New Guinea mountain chain, a formidable alpine massive. The lowest passes to cross from north to south or vice-versa are at about 3,700 m altitude; the highest summit of the Province, the Puncak Jaya or Carstensz Top, reaches 5,000 m, while the highest peaks in the country of the Eipo (e.g. Abom, Mt. Juliana, Gunung Mandala) are about 4,700 m high. The geological situation is such that the northern slope is much more gradual than the one on the southern side, where often very steep cliffs make human access very difficult. Still, these high ranges with their threatening cold temperatures and lack of food are commonly traversed by the local people. Their survival then depends on finding suitable rock shelters where one can build a fire and a makeshift windshield of branches, grass and bushes in the narrow, rain-protected strip under overhanging rocks. The Eipo and their neighbors undertook, and still make these potentially dangerous trips for a number of reasons, mostly for visiting trade and marriage partners on the other side of the range or for snaring or otherwise hunting the small marsupial rats and mice which live in this altitude. People actually die up there, the most feared form of death, *moke baybubuk*

<sup>146</sup>See Simon and Schiefenhövel 1989, which is a film on *mote* ‘visiting feast’.

‘he/she died out there in the rain without protection’. The loneliness and exposure to the forces of nature is perceived as horrible rather than death as such, which was, and usually is, accepted with a fatalism produced by the normative power of the factual: around each individual there is a lot of dying, plants, animals and humans die and (apart from religious, i.e. psychosomatic forms of medical treatment) there was never a chance to do anything about this. Besides hunting and trapping, the region of the mountain forest above the regularly inhabited areas was utilized to provide building material for the houses and collect wild foods. The most important of these was *Pandanus brosimos*; the nut-like seeds of the large compound fruits have a high fat content, otherwise very rare in the Eipo diet. Other edible plants, like berries and mushrooms, were also gathered in this region.

The radius of firsthand geographic knowledge of the Eipo (and the other peoples in this part of highland West New Guinea) was about three days (fast) walking. They did not venture any further as there were no relatives on whose assistance they could count for food and protection. Walking was and is the only form of getting from one point to another. Today, a small number of airstrips facilitate travel to some extent, provided one has the money for the ticket. Small children very soon acquire amazing skills in mastering difficult terrain with bare feet. It is impressive to see the relative ease with which everyone, including old persons, walks on slippery narrow logs, wades through deep swamp and finds a footing in stretches of vertical walls. None of the informants ever complained about the necessity of walking to distant gardens, hunting grounds or villages.

#### 2.4.6 Relationship to neighboring groups

The Heime River runs southwards in a kind of mirror image of the Eipomek River which runs northwards. Here, near the village of Langda, are two quarries of Andesit stones, the material from which high quality stone adze blades can be knapped. The next such place is about 150 km away (Balim Valley). The relationship of the Eipo to the Heime was, therefore, of vital importance: without stone adzes, neolithic life was impossible. Apart from this trading relationship (the Eipo paid for the unpolished stone adze blades with stringbags and food stuffs less frequent in the Heime Valley) marriage partners were often found in the two valleys across the dividing range. It is, therefore, not surprising that such trips were regularly made, either in larger groups invited to dance and feast<sup>147</sup> or in smaller groups of a few family members, despite the fact that the journey involves climbing from 1,700 m (the altitude of Munggona, the central village of the upper Eipomek Valley) to 3,700 m (the pass) and then approximately 2,000 m down again to Langda and the other villages on the southern side. Sometimes this 4,000 m feat was performed by the locals in a single day. The mountain range was therefore, as mentioned above, not a ‘natural border’ for these Papuan groups.

Relations with the neighbors in the Tanime Valley east of Eipomek were not as close, but good, whereas the neighbors in the Famek Valley to the west were the traditional enemies.

Warfare (*ise mal*, *male fey bin-*) was common (11 months during the first fieldwork period from 1974 to 1976) and caused many deaths, as did intragroup fighting (*abala*) in the village or political alliance: 25% of the men were victims of armed conflict.<sup>148</sup> There was no system of conflict resolution through a third party, therefore revenge and the consequent

<sup>147</sup>Simon and Schiefenhövel 1989, Eibl-Eibesfeldt 1995.

<sup>148</sup>Schiefenhövel 2001.

spiraling escalation of aggression were the cause of the high blood toll and, as mentioned above, for the high degree of cultural pseudospeciation so typical for New Guinea. Cannibalism (*ninye dina*) occurred exclusively in the course of warfare; when an enemy had been killed in a situation where his body could not be defended by his own group, it would be cut up, carried to the village of the enemy and prepared there, in the traditional earth oven, for a ritual meal. It is interesting that some persons declined to participate in these ceremonies which were, as the informants said, designed to destroy the slain enemy completely and utterly with one's teeth.<sup>149</sup> Since 1979 the *pax christiana* has so far stopped warfare between the Eipomek and the Famek Valley and drastically reduced intragroup homicide.

#### 2.4.7 Linguistic overview

The Eipo language features predominantly a subject-object-verb order.<sup>150</sup> Object-subject-verb structures are frequently used as well. Compounding is the main source to denote or construe word meaning. Nouns are generally not inflected and not morphologically marked. They are morphologically simple and case marking is pragmatically handled, i.e., the actual discourse marks the subject and object of a sentence or situation. In transitive propositions the noun is profiled as the direct object, things and living beings are acted upon, they undergo actions, manipulation and creation by human beings. Gender (only for animals) is profiled by ways of compounding and derivation, e.g., using *yim* for 'male' or *kil* for 'female' to classify the noun, if needed for particular reasons. In normal speech, gender is not specified in verb conjugation. Number is expressed either by context or via the verb morphology. Nouns are modified by adjectives. More specifically, adjectives denote dimension, distance, and position in geographical and social space. They also denote color, age, value, and properties of human beings, animals, plants, and objects. The class of adverbs profiles verbs, adjectives, pronouns, adverbs, and sentences. Eipo differentiate between various adverb types such as temporal ('day', 'time') local ('down there', 'in the middle', 'into the direction of', (see the lists of terms for spatial deixis, tables 2.7 and 2.8), and modal adverbs, degree adverbs ('very'), and focus or conjunctive adverbs ('also', 'too'). Verbs denote actions and processes.

According to cognitive linguistics, verbs, as opposed to nouns prototypically profiling landmarks and objects located in space, denote motion events between such landmarks, actions, processes, or conditions.<sup>151</sup> Verbs designate a process unfolding in conceived time.<sup>152</sup> Langacker calls a verb a 'symbolic expression' whose semantic pole (a symbolic structure consists of a semantic and a phonological pole) profiles a process.<sup>153</sup> The quote below summarizes the idea of a process in connection to the verb as a symbolic expression unfolding in time.<sup>154</sup>

A process is defined as a sequence of configurations (states) conceived as being distributed over a continuous series of points in time. Usually the separate con-

<sup>149</sup>Heeschen 1990.

<sup>150</sup>The following outline is based on Heeschen 1998, 197–287. Note that Heeschen claims also that Eipo is a noun plus verb language with the possibility that further nouns are basically treated as a free units, i.e., associated constituents are freely moved around this basic unit (Heeschen 1998, 286).

<sup>151</sup>Bußmann 2008, 773.

<sup>152</sup>Langacker 1987, 244.

<sup>153</sup>Langacker 1987, 244.

<sup>154</sup>Langacker 1987, 143–144.

figurations are distinct, i.e. a verb typically designates a change through time; a normal verbal predication is therefore highly complex, for it incorporates as many separate conceptual situations as there are recognizable different states in the designated process.

Adapting Langacker's definition, verbs in Eipo profile various processes such as aspect and tense, but also person, number, and mood. The morphemes are suffixed to the verb. Syntactically, verbs profile predicates, and person-number suffixes agree with the subject noun phrase (NP). Note that NPs in Eipo can be constructed out of a noun or a pronoun. The grammatical suffixation of the verb can be parallel to Eipo proper nouns, which can take suffixes for human beings indicating gender. It is also important here to mention that the number of nouns is inferred either from the context or profiled by the verb's morphology and its respective suffix.

More important for the discussion of spatial language is the lexicalization process of compound verbs. This process of the formation of lexical units (as opposed to grammar) is a characteristic typological feature of Mek languages. With respect to position in space, Heeschen argues that *buk-* 'to sit' and *tek-* 'to stand/stay' are the main lexemes in profiling space.<sup>155</sup>

As such these verbs behave like posture verbs in most Germanic languages and, more specifically, they are similar to the above described classificatory verbs. It is not argued here that the Eipo language features a classificatory noun/verb system. Nevertheless there is a tendency for classification, albeit a weak one which is not comparable to the other Papuan languages or Dene.<sup>156</sup>

Foley gives an example from Waris, a Papuan language spoken in Sandaun Province, Papua New Guinea, in which morphemes are prefixed to the verbs encoding objects found inside a container (*vela*), spherical objects (*put-*), food cooked and distributed in leaf wrappers (*ninge-*), leaf-like objects with a soft stem or no stem (*lé*), leaf-like objects with hard stem (*pola-*), etc.<sup>157</sup>

As opposed to the rather limited encoding possibilities of position described above, in Eipo "reference to direction is systematically made more precise [...]" in Eipo.<sup>158</sup> This implies that the main semantic function of Eipo verbs is the denotation of motion in space.<sup>159</sup> Hence, it is not so much a static location of the figure in a certain place but rather the trajectory of the figure with respect to the ground which has a higher degree of specificity.<sup>160</sup>

With respect to the assumption that Eipo features classificatory verbs, we have seen that in Dene Chipewyan various verbs encode different characteristics of the handled objects. Examples were verbs of handling, manipulation, continuing manual contact, e.g., 'give', 'hand', 'take', 'put', 'handle', 'bring', 'carry'. We see a system of verbs that encode different aspects of actions. Partially controlled action, for instance, includes an agent (e.g., 'toss', 'throw', 'hang up', 'set down', 'drop', 'lose'), while verbs of free movement are independent

<sup>155</sup>Heeschen 1998, 234.

<sup>156</sup>Heeschen argues for such a tendency in Eipo (personal communication); for Papuan languages in general see Heeschen 1998, Wurm 1982.

<sup>157</sup>Foley 1986, 95.

<sup>158</sup>Heeschen 1998, 234.

<sup>159</sup>Heeschen 1998, 231.

<sup>160</sup>Thiering 2013.

of an agent (e.g., ‘fall’ or ‘tip over’ in Dene).<sup>161</sup> This system enables the language user to profile exactly the semantic features of the object and its manner of motion to be encoded.

Finally, it has been noted that Papuan languages have a complex morphology especially in the verb system. In particular, the morphology features agglutinative patterns. The complexity of the verb makes the languages interesting especially in comparison with First Nation languages of the Americas such as Dene Chipewyan,<sup>162</sup> Hopi,<sup>163</sup> Navajo<sup>164</sup> Slavey,<sup>165</sup> all supposedly polysynthetic languages. With respect to polysynthesis Boas indeed claims that<sup>166</sup>

a large number of distinct ideas are amalgamated by grammatical processes and form a single word, without any morphological distinction between the formal elements in the sentence and the contents of the sentence.

Cook notes that in Dene a verb stem cannot alone constitute a word as opposed to a noun stem.<sup>167</sup> He claims that the internal structure of a verb is equivalent to a full sentence in English.<sup>168</sup> Arguably, such grammatical amalgamation processes are also found in Eipo to a certain extent.

We conclude this subsection with some comments on tense-aspect marking. The Eipo language possesses six tense-aspect suffixes and six sets of tense-mood-person-number suffixes.<sup>169</sup> With respect to tense-aspect the Eipo language distinguishes today’s past (past.i), near past (past.ii) and remote past (past.iii). The same applies to the future aspect, i.e., immediate (fut.i), near (fut.ii), and far future (fut.iii).<sup>170</sup> The following example from Eipo presents the fine-grained structure of aspectual marking.<sup>171</sup> It is a typical construction using the deictic morpheme *a-* ‘here’.

<i>aik</i>	<i>a-bu-lam-se,</i>	<i>bai</i>	<i>a-ba-lam-se.</i>
hut	here-sit-HAB-1SG.PAST.III	outside	from/here-go-HAB-1SG.PAST.III
‘I lived in this hut, I was going from here into the forest.’			

The speaker of the quoted phrase, first person singular, explains that s/he lived in a specific house that was the point of departure for several trips into the garden land and the forest. The deictic marker relies on the speaker’s intended orientation in which ‘here’ means a close proximity.

The next section presents some fundamental cultural concepts, especially in Eipo, showing some interesting culture-specific practices such as building a house. Additionally, some environment-based topographies will be presented.

<sup>161</sup>Cook 2004a, Thiering 2006, Thiering 2009a.

<sup>162</sup>Thiering 2009b.

<sup>163</sup>Malotki 1979, Malotki 1983.

<sup>164</sup>Young and Morgan 1987.

<sup>165</sup>K. Rice 1989.

<sup>166</sup>Boas 1977, 74.

<sup>167</sup>Cook 2004a, 85.

<sup>168</sup>Cook 2004a, 86.

<sup>169</sup>Heeschen 1998, 246.

<sup>170</sup>Heeschen 1998, 257, table 47 gives an overview of the tense-mood-person-number suffixes.

<sup>171</sup>Heeschen 1998, 143.

## 2.5 Center, periphery and distance in Eipo

This section presents specific spatial concepts of Eipo only. This is because the data concerning these aspects are much more comprehensive than for Dene.

### 2.5.1 Building an Eipo house

Building an Eipo house is an interesting example in which an old tradition, an old practice becomes visible. This is a tradition based on joint action rather than orally transmitted knowledge. The community's center of life was the men's house (*yoek aik*), a most important point of reference. Sometimes two or three of these sacred houses existed in a community. All socially meaningful structures were usually situated concentrically around the sacred men's house, radiating out of that center. Hamlet, garden, and forest created quasi circular rings around the *yoek aik* and the sacred village ground, *asik kata*. Every place or location in the garden area is owned by someone, be it a hillside or a knoll. There is a fine grained network of place names represented in mental maps which are already very well developed in children and juveniles, who give accurate accounts of this aspect of local geography.

The mountains above the garden land, used for collecting and hunting, are connected to specific clans, but can be utilized by others as well. Sacred places can be found all around the living space, i.e., there is a sacred matrix or topology of exactly determined locations based on sacred arrays in the area.

One of the major points of departure for orienting oneself in Eipo culture was the house, either the men's house or the women's house (*bary aik*) or one of the family houses (*dib aik*). The men's house signified the center, while the women's house was at the periphery of the village. The house as a general concept of shelter can be understood as a universal place for protecting human beings from the environment, and as a place of safety and comfort, a place in which the family unit functions as a small-scale community in itself. It is interesting to survey more specifically the various usages in which 'house' appears as a location, either as a point of departure or as a place of an event in the life of the Eipo (cf. the entries under *aik* in the dictionary<sup>172</sup>). The house has crucial locational functions in other cultures as well. This should be of no surprise as it is a shelter and place of ritual habits in Western cultures as well. Moreover, the concept of 'house', signifying the place where a family or similar group lives, is primarily psychological, not architectural.

The following summary is based on Koch's work, specifically the section on building family and men's houses.<sup>173</sup> It introduces not only the technique and the different steps for building a house in the Eipo culture, but also the central significance of houses, including the various sacred objects. Moreover, several semantic structures extracted from the Eipo dictionary will be presented, if possible with their language contexts.

The noun *aik* encodes 'house' and various usages imply its importance or significance for the Eipo community. The entry alphabetically first in the above-mentioned Eipo corpus beside *aik* itself is *ninye aik bun berekilbin* 'people are meeting in the core of the house'. The entry for *aik* contains a number of related expressions specifying the function and importance of the house. First and foremost *aik asin* means the 'fireplace in the house'. Further, *aiktam* designates 'in the house', 'inside'; note the locational construction N + suffix to encode

<sup>172</sup>Heeschen and Schiefenhövel 1983.

<sup>173</sup>Koch 1984, 38–56.

‘inside’ based on the interior of the house. The way home or to the house is encoded as *aik bisik*. The term *aik* is also used for a sickness caused by a spirit as in *aika* or *aik mek dikmal* ‘a sickness caused by a spirit’: a severely sick person does not leave the house any more, often until he or she dies.

The basic form of an Eipo house was round with a cone roof, while less well built houses were either round or rectangular with a ridge roof; today quite a large variety of shapes and sizes are found in the Eipo villages. The average diameter of a family house was between 2 and 3 meters and the height about 2 meters. The average men’s house had a diameter of between 5 and 6 meters with a height of about 4 meters.<sup>174</sup> Most of the houses had an elevated ground floor at a height of about 40 cm to 100 cm above the actual ground. The space underneath (*ambonga*) was sometimes used as a hog house, to store firewood, and to keep the ashes. Hence, it was a kind of a stockyard for all sorts of things in general. In the case of the men’s houses it was also where the spirit houses, *isa aik*, were placed. The living space measured about 1 to 2 square meters per person.<sup>175</sup> These close quarters were not perceived as a disadvantage by the Eipo, but as a welcome means to literally stay in direct contact with each other. Building a house is primarily men’s business and the process of building a house is classic group and assembly work. All the necessary construction material, including the planks for the walls which are hewn where the specific trees grow in the mountain forest, is gathered weeks beforehand, i.e., the actual process of building the house is similar to assembly work on a construction site. Women participated, even in the building of a sacred men’s house, by carrying building material to the storage places or the actual building site. They still do this today. Reusable material from old houses was, and is, incorporated into the new building.<sup>176</sup>

The Eipo mainly used one universal tool, the adze *ya* with a blade made of stone. This specific kind of well-made hatchet was used to fell trees, to split up logs and to shape posts and other building material, including rattan for binding. One could say that the stone adze was some kind of ‘leatherman’ or ‘swiss knife’ for the Eipo in terms of a universal tool. The different stages in constructing and building a house will be described below with respect to the former tradition of building a men’s house. This socially, politically and religiously most meaningful building was the most important anchor in the Eipo community. Its continuity was granted by keeping the same location and the same sacred objects and by using parts of the old building material for the new building. Koch and Schiefenhövel (2009) documented the reconstruction of the old men’s house of the village of Munggona, called the *Binalgekebnaik*. It had a diameter of approximately 6 meters. Planning took place far in advance and some of the sacred rituals were already carried out in the forest. To start off, the men removed the sacred digging stick *kwemdina kama* (a relic from mythical times, the beginning of creation) and placed it against another men’s house during reconstruction work. Normal digging sticks, *kama*, were used as tools, e.g., to dig, to harvest, to weed, and to level the ground.<sup>177</sup> The *kwemdina kama* was the most important sacred object in the southern Eipomek Valley, a holy grail, so to speak. Then the men took off the cone roof and placed it beside the building site. The ensuing demolition of the old house was accompanied

<sup>174</sup>This difference in size already indicates the significance of the men’s house.

<sup>175</sup>Röll and Zimmermann 1979.

<sup>176</sup>Usually the roof of an old house is used again, along with planks for the walls and other pieces that are still of good quality.

<sup>177</sup>Michel 1983, 66.

by sorting out usable material; phrases describing this are *aik nonge ulobuka dobnab* ‘we take away/pull down the house (except the roof)’, *aik nonge duk’namab* ‘we will take the house apart’, *aik kolubrabuk* ‘one broke down the house/the house is destroyed’. During this process the spirit houses *isa aik* became visible. After leveling the ground the men brought *ayukumna*, long house posts, which provided the main structure of the house. This stage was orchestrated like a procession and performed in an ecstatic, rhythmic dance, accompanied by the typical inspiratory whistling which provides the basic rhythm during Eipo dance feasts. The *ayukumna* were driven into the ground to a depth of about 40 cm. Rolls of bark from a specific conifer were brought into the circle of posts to check whether they fitted the diameter of the house. This was the only type of measurement done; all the other pieces were placed intuitively. The bark would later cover the floor, providing a soft, even top layer (*amsona*).

The next step was to set the four slim poles *ateka* to delimit the fire place (*ukwe asin* ‘fire place in the house’). Two of these are called *mem ateka* (taboo poles) and have a sacred meaning. They were covered with fern leaves to protect the men’s hands from being burnt by the hot poles. When the men brought them, they again danced and chanted rhythmically. Several layers of circular transverse struts *afanya* were then carefully bound to the *ayukumna*. They held the house posts in place and provided a horizontal rim supporting the floor. Later another ring of *afanya* was fixed at the upper end of the posts to stabilize them and provide support for the roof.

In building a men’s house or other houses the next step was to place, in a criss-cross fashion, long flexible sticks on the horizontal rim provided by the *afanya*. This created a flexible floor which slightly slanted toward the middle as an interesting feature which helps utilize the heat of the central fireplace more efficiently. To give more stability to the floor layers (30 or more men may be inside the men’s house at a given time), crossbeams *wanun yo* were squeezed horizontally underneath. For family houses reed (*Miscanthus floridulus*, *fina*) was sometimes used instead of wooden sticks as it is easier to come by. Short planks, *abelenga*, reaching from the ground to the level of the floor, were fixed with rattan, the classic material for all bindings. This first circle of short planks typical for men’s houses blocked the view of the space below the floor where new little spirit houses were placed in the meantime. The planks forming the wall of the men’s house above the floor and reaching to the roof were gradually fixed as well. Even today these planks are still cut from a tree (*Galbulimima belgraveana*, *lue*) which easily splits so that flat, even boards can be produced. Today, although Christianity has superseded their belief in spirits, the Eipo still seal the walls of their houses as securely as possible: Little openings, cracks etc. could provide an entrance for spirits or other harmful agents, and in former times also for arrows.

The following language examples reflect the importance of spirits in the old Eipo tradition: *aika* ‘sickness’ (caused by house spirits); *isa kum angnulamak* ‘the spirits come up to the neck (i.e. they eat the person, make him/her fall sick)’, *aik mek dikmal* ‘water is stuck to the house/(metaphorically) the spirits are catching them (the inhabitants)’, *isenang* ‘the spirits, (met.) the enemies’, *kingkin bisik keniklamak* ‘they are caulking the clefts (between the boards of the wall of the house as protection against arrows and spirits)’. Especially the last example indicates how important it was to protect the house from the spirits. In the small, roughly built houses underneath the ground floor of the men’s houses they had an official abode and, at the same time, were contained so that they did not come into direct contact with people.

The most devastating events, believed to have been caused by a giant spirit (*Memnye*) living deep down underground, were the two earthquakes in June and October 1976, both measuring above 7 on the Richter scale. Throughout, the whole ritual connected to building a men's house and various kinds of sacred ritual practices were thought to be necessary to calm down or appease the ghosts. It should be noted that the Eipo regarded earthquakes as well as sickness, accident or other mishap as punishment for broken taboos or disrespect toward the spirits. The massive earthquakes, in the course of which several Eipo died and which completely destroyed the whole village of Munggona and its sacred men's houses, including many sacred objects, had a deep impact on the people. This facilitated the transition to Christianity and thereby initiated the very rapid process of acculturation. As a consequence, the transmission of cultural knowledge passed on orally via myths was partly interrupted.<sup>178</sup>

Returning to the description of the sacred *Binalgekebnai* men's house's construction, the next step was to construct the support to hold the conical roof, the main weight of which was resting on a short central pole which was attached to the four poles, *ateka*, delineating the fireplace. The outer rim of the roof was resting on the upper end of the house posts (*ayukumna*) stabilized by the top ring of *afanya*. Finally, the old roof was carefully put in place; many men, and sometimes women even, participated in this final climax of sacred actions.

### 2.5.2 Natural limitations in Eipo

Mountains and the sky mark the limits of the Eipo world. The place where the mountain and the sky meet is called *motokwe ime ebrarik* 'mountain (or land) and sky, the two meet'.<sup>179</sup> Beside the sky as an obvious visible limitation, the mountainous region has its repercussions on the Eipo culture and language in terms of places, and natural limitations. See the following examples, all indicating the importance of environmental landmarks such as mountains and their function in Eipo culture. Table 2.4 presents various semantic differentiations of the concept 'mountain' in Eipo.

Clearly and not surprisingly, the mountainous region has a culture-specific and central meaning for the Eipo, as it has in any other region with such environmental specificities.<sup>180</sup> Hence, mountains have several functions in Eipo. Beside the above meanings, some related concepts are discussed below.

The Dakul and the Lyene are particularly important mountains formerly believed to be the 'mythical abode of Sun and Moon' (1143, 3732). The direct connection between the Moon and the Eipo region is expressed in the term *Yaburye* 'mythical river attributed to Moon and Sun' (5683). Both the Sun and the Moon have specific cultural values as in *ketinge-ton wale-ton Dukuramduweik a-kururak* 'Sun and Moon, the two of them created the Dukuramduweik-men's house here' (3038), or *im maka* 'secretion of the sky (code for: Sun and Moon)' (3776/4).

In table 2.5 there are some descriptions of the various stages and some metaphorical expressions relating to the various positions of the Moon, which is also connotated as female: *wale are kil* 'the Moon is a woman' (2641/1). The examples present various metaphors of the Moon in its different stages in Eipo.

<sup>178</sup>Heeschen 1990, 143.

<sup>179</sup>Which might be translated as the concept of a 'horizon' (1692).

<sup>180</sup>Berthele 2006.

---

<i>motokwe aryuk-</i>	‘(mythologically) to pile up’ or ‘create the mountain’ (194)
<i>motokwe berengne</i>	‘a world of emptiness’ or ‘solitude, i.e., without any plants’ (475)
<i>motokwe akonum</i>	‘the land lay bare, nothing grew’ (476)
<i>bereksingibuk</i>	
<i>motokwe cange wik</i>	‘mountain is spacious’ or ‘big’ (1050)
<i>motokwe dandoble</i>	‘the mountain’ or ‘the area is uninhabited’ (1176)
<i>motokwe kon dinib ’mak</i>	‘they go round the ridge of the mountain (in order to avoid climbing it)’ (1442)
<i>motokwe dok</i>	‘flank of a mountain’ (1502)
<i>motokwe dub</i>	‘top of a mountain’ (1592/2) ( <i>bebengdina, bebengdin</i> = mountain top (a mountain range is often the border between two regions, e.g., between the Eipo and the Marikla, who were enemies; the same metaphor is used for the border between the world of man and the world of the spirits)
<i>motokwe seringsarang</i>	‘(magically) the empty earth shall bear flowers’ (1797)
<i>fabminyak</i>	
<i>motokwe filibable</i>	‘the mountain becomes smooth’ or ‘flat’ (metaphorically for ‘to faint’, ‘to become unconscious’) (1962/1)
<i>motokwe kwakwa</i>	‘the world (= mountains) will be transformed into a butterfly (when praying to the ancestors it is asked that the leaves of all food plants should move in the wind like the wings of a butterfly)’ (3102/1)
<i>lakabdanamle</i>	
<i>doa motokwe-dam</i>	‘the clouds are piling up at the mountain there’ (3425/7)
<i>lelelamle</i>	
<i>loun motokwe</i>	‘an area or a mountain not under taboo where everybody is allowed to go’ (3620/1)
<i>marman, motokwe</i>	‘transverse (path) under a cliff’ (3867)
<i>marman</i>	
<i>motokwe kon</i>	‘mountain top ridge’ (4087/4) ( <i>sin</i> ‘mountain top’, ‘high plateau’)
<i>motokwe tob-nang</i>	‘those who know about the world are able to explain the world’ (4087/6) ( <i>toba</i> = ‘it is there’; ‘is/are present’, ‘continuous’)
<i>motokwe yim</i>	‘mountain (ridge edge)’ (4087/7) ( <i>bisik wamumna</i> ‘ridge’)
<i>tarekna motokwe</i>	‘(lit.) cold mountains’ or ‘high mountains’ (4087/9)
<i>motokwe erelamle nun</i>	‘the mountains arose at a time when we weren’t yet there’ (4448/2)
<i>gum ob</i>	
<i>sik motokwe</i>	‘(this is) their mountain’ or ‘area or hunting ground’ (4708/2)
<i>motokwe tilibak</i>	‘places or areas where the trees grow densely or where there is a lot of growth’ (5181)
<i>motokwe yupa</i>	‘pass’ (5920) ( <i>Tekiltakalyan</i> ‘to climb up and meet’, ‘to meet on a mountain top, a pass’ (5103)

---

Table 2.4: Semantic variation of ‘mountain’ in Eipo

<i>wal su eleklamle</i>	‘the Moon is wrapped in leaves/can no longer be seen’ (5450/6)
<i>wal yulamle</i>	‘the Moon is cooking (in the earth-oven)’, ‘new moon’ (5450/7)
<i>wale yang kelamle</i>	‘the Moon is or becomes like a tusk’, ‘crescent moon’ (5775/2)

Table 2.5: ‘Moon’ in Eipo

As is apparent, the Moon in its different stages is encoded via figurative usages that intuitively make sense to a Western speaker as well. The general importance of the Moon for fertility is evident also in Eipo. The Eipo interpreted the waning and waxing of the Moon as phases of its menstruation. In particular, the New Moon was thought of as residing in a heavenly women’s house, just as women during their menstruation reside in the women’s house for about 3–4 days. The Moon marks, additionally, the connection between a mythical spirit and the bare landscape, in particular the high surrounding mountains.

### 2.5.3 Distance in Eipo

The data from the dictionary and Heeschen’s grammar, the various ethnographic films, and the myths<sup>181</sup> suggest that the Eipo do not possess abstract terms for distance, area, and volume. In one instance, an interesting observation was made. Work at the airstrip, carried out by the local people under supervision of Wulf Schiefenhövel and an assistant from Ilu, a mission station in Dani country west of the Mek area, had been going on for many weeks. The general shape of the landing field was visible. It was delineated by longitudinal ditches which were dug to drain off the substantial amount of daily rain water at the sides. The width was thus determined, as well as the lower and upper end. When it was announced that Wulf and Grete Schiefenhövel would walk to Bime, the nearest mission station which had been opened two years previously and from where the advance group of the German Research Team had started its five-day walk to Eipomek, several men and boys said they would like to come along. As soon as the group had arrived in Bime, some men looked for string, i.e., long sections of bast and other fibres and similar material. They connected many pieces by knots and when the string was long enough, measured the width of Bime airstrip, marking its size before the string was rolled up and stored in one of the men’s bags. Schiefenhövel was quite surprised by this activity and asked what they were doing. They answered: We are comparing (*kiklib-*) the ‘axillary wing’ (*ke fol*) of the airplane. We know that the plane can land here and we want to check whether the *ke fol* of the airstrip we are building with so much effort in Eipomek has the same size so that the plane can also land there. ‘Stone-age’ Eipo were checking the job of the white fieldworkers as they wanted to be sure that the engineering was done according to standard. This is quite a scientific procedure. They were happy when, on return from Bime, they found that the *ke fol* of their future landing field had the proper width. This measuring was not done by counting steps or feet, but by a quasi holistic act of comparing. This act of comparing reflects the idea that distance and length is preserved regardless of place and direction, a central cognitive structure in the gestalt-like mental model of space.<sup>182</sup>

<sup>181</sup>Heeschen 1998, Blum et al. 1979–1996, Heeschen 1990, and Heeschen and Schiefenhövel 1983.

<sup>182</sup>Thiering 2014, see also Chapter 1 of the present book, in particular sections 2 and 3.

<i>boltak-</i>	‘to keep distance from someone or something’ (732)
<i>boltakab-</i>	
<i>yanyane faye bin-</i>	‘to leave foot-prints (song and dance texts for) to walk long distances’ (1874)
<i>inib-, enib-</i>	‘(to make see) to search, to invite over a long distance’ (2190)
<i>karen, karin</i>	‘unoccupied, keeping distance’ (2395)
<i>karenkaren</i>	‘they go separately, keep distance’ (2395/2)
<i>balamak</i>	
<i>aik kwakne bisik</i>	‘the path through / in between the houses’ (3098)
<i>lukfara ban-</i>	‘to look out, to look out into the distance’ (3647)
<i>nisin diberen-</i>	‘to look into the distance’ (4395)
<i>onob-</i>	‘to refuse, to turn down, to keep at a distance’ (4527)
<i>yan onolbin-</i>	‘to make a big step (on the day when the sacred men’s-house is built one is not allowed to walk a long distance. The taboo is apparently nullified by taking a big step over a puddle or a small pond.)’ (4528/1)
<i>tamublabdongob-</i>	‘to gain a greater distance to someone who is following, to keep a distance when walking’ (5000)
<i>tekisib-</i>	‘to keep a distance’ (5107)
<i>tekisibnin</i>	‘the women keep a distance (to the men while walking)’ (5107/1)
<i>balamak</i>	
<i>usamkila</i>	‘clouds rising in the distance’ (5411)
<i>webrongob-</i>	‘to follow closely, to be attracted’ (5526)
<i>winilkidik-</i>	‘to wander about, to walk big distances (said of the ancestors)’ (5627)
<i>bisik</i>	‘way, path, direction’ (612)
<i>bisik dukuble</i>	‘the path/entrance is just wide enough (to be able to carry s.th. through)’ (612/5)
<i>bisik</i>	‘fork in the road’
<i>kwangdanya</i>	
<i>bisik lebarikna</i>	‘the circumventing’ or ‘avoiding of a steep part of the path’

Table 2.6: Various expressions of distance in Eipo

A somewhat similar idea in terms of using straight lines, but without comparing lengths, is implied, as already mentioned above, in the practice of delineating garden lands. *Wa* (usually old gardens reused after approximately 15 years of lying fallow, sometimes newly cleared primary forest) is divided into individual plots without employing fixed units of distance. The borders of the plots are commonly marked by small trees (*yurye*, *Cordyline terminalis*, a sacred plant in many regions of the Pacific) in such way that the line connecting the *yurye* is defining the end of one plot and the beginning of another owned by families and passed on in the patriline. To encroach into the land of another family is considered a serious offense and leads to open conflict.

Some morphemes indirectly represent ideas of distances such as ‘in between’, i.e., a specific distance between two landmarks. They are presented in table 2.6.

The most common word to express distance is *fera*, *ferē* = ‘distant’, ‘far away’, requiring a long walk. The term *fera* as well as the various phrases presented above do not, of course, entail a specific, precise measure of distance, as steps, miles or kilometers. But for an adult member of the Eipo society, who knows her or his territory extremely well and has also walked to places further away, this term is sufficient. The problems arise when foreigners, like white researchers, hope they can extract some measurement of distance or time from their informants: *fera* can be quite close, but also very far away. Hence, it can be stated that there is no technical term for distance in Eipo, but a variety of context-dependent phrases and words, for which one can use the term ‘distance’ as a translation.

Nevertheless, with respect to building houses, traps or bridges the Eipo are able to conceptualize the exact structure and architecture and order of actions necessary to assemble various materials to build the different types of houses, the technically advanced traps (as in Dene Chipewyan) or a bridge. It is apparently not necessary to have an explicit and abstract measurement to construct buildings or even the rather sophisticated cane bridges spanning across wide rivers, examples of neolithic high-tech. Similarly, abstract terms for distance are not necessary for constructing stable buildings and functioning devices whose stability and functioning we would today explain using the principles of physics. It is not necessary to know, e.g., the abstract concept of the number  $\pi$ , i.e., it is not important to know and apply the idea of a circle in a strictly geometrical sense. The Eipo and other peoples have developed practices and ritual actions which fulfilled their purpose more effectively than others and thus became part of their culture.

## 2.6 Representations of spaces in Eipo and Dene Chipewyan

In this section, the two languages under survey are compared with respect to their spatial concepts, ways of spatial categorization, and use of spatial markers of environmental landmarks.<sup>183</sup> As stated in the introduction, our interpretation of Eipo and Dene spatial concepts is guided by the fine-grained analysis of Hopi ideas of space (*Raumvorstellungen*).<sup>184</sup> Malotki’s survey seeks to present the various facets of this language in their function of encoding spatial relations in specific detail.<sup>185</sup> Eipo and Dene Chipewyan present specific environment-dependent encoding patterns mirrored in the languages.<sup>186</sup> The mountains and rivers as important limitations in Eipo and Cold Lake in the Dene culture show their repercussions in the language patterns and the carving-up of spatial concepts on the language level. In the following sections we will present a variety of examples from Eipo and Dene showing various ideas of space.

### 2.6.1 Orientation in Eipomek

The following summary on Eipo structures presents some firsthand data.<sup>187</sup> As we have described above, in the Eipo religious tradition humans appeared on Earth from the underground and gathered in groups. Their most important place became the men’s house. It was

<sup>183</sup>Mark et al. 2011.

<sup>184</sup>Malotki 1979.

<sup>185</sup>Svorou 1993, Thiering 2013.

<sup>186</sup>Thiering 2014.

<sup>187</sup>Heeschen 1990, Koch 1984, Koch and Schiefenhövel 2009. A further source are Schiefenhövel’s recent field-notes 2008–2010.

a crucial place for securing the life and prosperity of the hamlet. It was hence the center both as a real location and as a spiritual place. From the center to the periphery there was a network of paths and additionally of arrangements and limitations that began inside the men's house, e.g., with a specific seating arrangement and positioning of the sacred objects. It has to be added that each Eipo village had one or two women's houses, which were also sacred and taboo for the men. In some respects they are the equivalents of the men's houses for the women. This social organization following a marked gender dichotomy, and the specific environmental conditions, are well established in the language structure and religion, i.e., many points of orientation are semantically filled with culture-specific entities or landmarks. The following two examples show this specificity.<sup>188</sup>

<i>a-kame</i>	<i>ara</i>	<i>lulukene</i>	<i>mem.</i>
here-stick	THEME	shake/make(VN)	forbidden

‘As to this sacred digging-stick, it is forbidden to cause it to be shaken.’

<i>am</i>	<i>bob-m-ik-ine,</i>	<i>ou-Dek</i>	<i>bob-ik.</i>
Taro	carry-DUR.-3PL./PAST.III-SCENE.	down/there-Dek	carry-3PL./PAST.III

‘They were carrying the taro, and then they carried them to the Dek River down there.’

The examples present some important and relevant objects in Eipo, e.g., the sacred digging-stick *kama*, sometimes pronounced *kame*, which was kept as the most important religious item, and the ritually important ancient food plant *am* ‘taro’, or specifically meaningful places, e.g., the Dek River, or the Northern lowland area. Moreover, the examples indicate the importance of cultural-specific habits relying on specific practices, e.g., the digging-stick as a sacred object is also responsible for a certain order or ritual as in *kama bukwotebnin yanamuk*, which can be translated as ‘the primeval digging-stick came putting everything in order and smoothing everything’. As the stick of creation it was kept in a specific place, some kind of shrine in the men's house.<sup>189</sup> Interestingly, in all cases a deictic marker (*a*) is used to indicate the exact position of the place, the direction or the event.

Eipo speakers orient themselves in their mountainous environment by a finely meshed network of names for mountains, hills, slopes, rivers, and plains.<sup>190</sup> Heeschen describes the use of this environmental topology:<sup>191</sup>

Eipo speakers mainly use the spatial deictics as a condensed and abbreviated structure in face-to-face-communication: here the deictics are accompanied by a pointing gesture.

Basic orientation in space for the Eipo is, as has been mentioned above, provided by five deictic points of reference based on the speaker's position, ‘here’, ‘there’, ‘up-valley’,

<sup>188</sup>Heeschen 1998, 270.

<sup>189</sup>Koch and Schiefenhövel 2009; Heeschen 1990, 85.

<sup>190</sup>Foley 1986; Heeschen 1998, 143.

<sup>191</sup>Heeschen 1998, 143.

‘down-valley’ ‘across (the valley)’.<sup>192</sup> The basic set of deictic markers consists of the following morphemes, taken from the dictionary.<sup>193</sup>

<i>a-</i>	‘here’
<i>ei-</i>	‘up there’ (see below for further examples)
<i>ou-</i> <i>u-</i>	‘down there’
<i>or-</i>	‘across here’, ‘across the valley’, ‘on the other side’, ‘the other slope (but not upwards)’ (4536)
<i>or-asik</i>	‘the hamlet over there’ (4536/1)
<i>or-deibsilyam</i>	‘put it there (at the same height)’
<i>ortiba</i>	‘it’s over there’, ‘across the valley, spot across the river’
<i>er-</i>	‘across the valley/the river’, ‘upward of own position’

Table 2.7: ‘Here’ and ‘there’: General deixis in Eipo

These examples exemplify the various usages of the dual distinction between ‘here’ and ‘there’, i.e., the horizontal distance and place of a speaker being ‘here’ and the vertical ‘up’ and ‘down’ distinction. All of the usages are rather unspecific in terms of metrical distance between the speaker and a potential hearer. We also see the importance of orientation depending on the environment, e.g., ‘river’ and ‘valley’. The prefix *d-* is added to deictic morphemes to form longer distances or sharper contrasts. The above data set presents a more detailed semantics of the basic deictic markers. The added prefix increases the spatial semantic detail in the encoding of proximal, medial and distal distances. In addition, vertical specification or specification of altitude is given in greater detail than in the examples above.<sup>194</sup>

<i>da-</i>	‘here’ (in a wider area around the speaker and hearer, here and there)
<i>dei-</i>	‘very far up there’ (across the mountains) vs. <i>fera</i> = ‘far way’, as opposed to <i>dam</i> ); <i>dam</i> = ‘close by’, ‘short (way)’
<i>dam</i> <i>banmarak</i>	‘the two of them are coming closer’, ‘they are approaching’
<i>dou-</i>	‘very far down there’ (‘very far down the valley’)
<i>dor-</i>	‘very far across the ridges in the next valley’; ‘at same level or lower than own position’
<i>der-</i>	‘very far across the ridge in the next valley’; ‘higher than own position’

Table 2.8: ‘Here’, ‘there’ and ‘far across’: Specified deixis in Eipo

<sup>192</sup>Note that the three valley-related orientations function in Eipo just like cardinal directions in Eipo. Hence, the frame of reference is in a transition from a relative to an absolute frame. For a survey of frames of reference, see Levinson 2003, Levinson and Wilkins 2006.

<sup>193</sup>Heeschen 1998.

<sup>194</sup>Heeschen 1998, 144.

These examples indicate that Eipo rely on a topographical system which includes, in these last cases, distances in various metric situations, i.e., proximal, medial and distal. In the example below, the deictic marker refers to a distance between speaker and another group of people.<sup>195</sup>

<i>Marikle-nang</i>	<i>lukenyan</i>	<i>or-yan-ma-se-ak,</i>	<i>a-mab-ma-lam-buk.</i>
Marikle-	night	from/across-come-	here-sleep-DUR-2SG.PRES-
people		DUR-us-3PL.PRES,	when(DS.)

‘During the night the Marikle people come to us from across (the valley) there.’

Syntactically the deictic markers are bound morphemes that combine with other parts of speech such as verbs, nouns, postpositions, and predicating suffixes.<sup>196</sup> Here, the deictic marker encodes the trajectory of the figure (the Marikla people, i.e., the enemy living across the valley, are coming) and their transition from their home location (the unspecific ‘from across the valley’) to an implied speaker or vantage point (‘us’).

An interesting example in terms of an imagined location is given below.<sup>197</sup>

<i>a-kil</i>	<i>ara,</i>	<i>a-yanga-lam-lye-ak-da</i>	<i>a-tek-am-lul.</i>
Here-	THEME	here-come-HAB-	here-stand-PERF-3SG.HORT
woman		3SG.MED-at-but	

‘As to the woman here, she may have come to the place where he might have been standing.’

The deictic marker *a-* used in the above example encodes, in the first instance, a particular place. In the second and third instance, it encodes an imagined or abstract space that is removed from the speaker to a distance in which ‘here’ (depending on the speaker) is not the location of the speaker in a real context. The locational marker removes the scene from the actual speaker/discourse. Heeschen argues that the Eipo are imagining a place they do not know. From a morphosyntactic point of view it is interesting that the deictic marker is used repeatedly. Every possible location is marked for each location of the figure and the ground, thereby identifying the places at which the actions of the two phrases take place.

The example below gives a flavor of the encoding of imagined things that a speaker describes to a hearer who does not know the spatial landmarks.<sup>198</sup>

<sup>195</sup>Heeschen 1998, 143.

<sup>196</sup>Heeschen 1998, 143.

<sup>197</sup>Heeschen 1998, 144.

<sup>198</sup>Heeschen 1998, 144.

<i>Aike</i>	<i>irikna</i>	<i>a-ub-ma-le-to-ak,</i>	<i>ou-tonun</i>
hut	edge	here-be-DUR- 3SG.PRES-as-at	down-as
<i>li-am-ik-ye-ak</i>	<i>aik</i>	<i>dike</i>	<i>ou-deli-lam-ak.</i>
put.into-PERF- 3PL.MED-and-at	hut	food (ritual)	down-put-HAB- 3PL.PRES

‘They put away the food at one edge of the hut, at a place which is similar to this one here (the speaker points to something), in a similar way they have put down there (things into a stringbag).’

It is apparent that this last example can only be understood in its real speech act context since the speaker is actually pointing at some place. As outlined above, another interesting aspect is the delimitation via mountains and thus a seemingly unspecific distance.<sup>199</sup>

<i>An</i>	<i>yuk</i>	<i>asik</i>	<i>a-ub-na-lyam,</i>	<i>nun-da</i>	<i>der-motokwe</i>	<i>bi-nam-ab.</i>
you	alone	hamlet	here-be- FUT.II- 2SG.HORT	we-but	very/far/across/ up/there-mountain	go-FUT.III- 1PL.

‘You alone should stay in this hamlet here, but we will go to the mountain very far across there.’

The idea of ‘very far across there’ seems rather unspecific for a speaker unfamiliar with the environment, but for the Eipo speaker the distance to the central range in the south is very well known. Moreover, it seems evident that the future tense marker encodes a distance in space as well. Note that future.iii is used for long-distance journeys, while future.ii is used to designate ‘staying here’. The hortative (mode of the verb specifying an act of collective action) construction *lyam* encodes the mode of the verb specifying a collective action, i.e., the part of the English translation introduced by ‘You should stay’ and ending with ‘we will go’. Both utterances are related to specific places, the ‘hamlet’ and the ‘mountain’. The opposite of *asik* ‘village’ or ‘hamlet’ is *bay* meaning ‘outside’ and thereby carrying the notion of ‘wilderness’, ‘uncontrolled’, ‘dangerous’ (cf. *bure*, *budu* ‘outside’; *bure ketib* ‘someone who stays outside, comes back to the village late’; *bure* is purely deictic, i.e., not used metaphorically to signify danger, threat etc.). *Motokwe* has several additional meanings such as ‘land’, ‘landscape’, ‘region’, ‘place’, and ‘world’ (see table 2.4). The prefixed bound morpheme *a-* has, as already shown, several meanings depending on the context as summarized in table 2.9.

The prefixed deictic marker *a-* encodes two possible locations depending on the speaker’s intention to indicate a specific direction, i.e., ‘here’ and ‘there’. Note that the morpheme *ortam* (*or-tam*) encodes, as mentioned above, ‘over there’; ‘across the valley’; ‘across the river’ (indicating direction) (4544).

The next section presents some general ideas of space in Dene, in particular concerning delimitations and limits, that are mirrored in the language.

<sup>199</sup>Heeschen 1998, 144.

<i>a-</i>	‘here’, ‘there’ (as opposed to ‘over there’)
<i>a-tam</i>	‘here’, ‘this way’ (indicating direction and place; <i>-tam</i> = ‘side’) (cf. <i>u-tam</i> = ‘down there’, ‘down the valley’ (indicating direction); <i>u-tiba</i> = ‘it is down there’, ‘down the valley/the river’)
<i>a-teba</i>	‘here it is’ ( <i>-teba</i> = predicative particle with deictic pronouns)
<i>a-tebuk</i>	‘here’, ‘this here’ ( <i>-tebuk</i> = predicative particle with deictic pronouns, pointing to something which is past or which had been mentioned before; what has been mentioned in the past or in the preceding conversation and is thus known to the speaker)
<i>a-binmal</i>	‘here’/‘there he/she/it comes’
<i>a-bisik</i>	‘this way’, ‘along here’
<i>a-motokwe</i>	(lit:) ‘this mountain here’, but also: ‘here’, ‘with us’, ‘in our place’
<i>a-nirya</i>	‘all this’
<i>a-yo</i>	‘the wood’/‘the tree here’, ‘this tree’/‘this wood’

Table 2.9: Deictic expressions in Eipo

### 2.6.2 Orientation in Dene Chipewyan

The previous section provided some basic spatial concepts in Eipo based primarily on environmental landmarks. This section presents some data from Dene Chipewyan and neighboring languages. It is based on Thiering’s field work.<sup>200</sup> This language has interesting spatial terms such as ‘up above’ (*yudaghe* ‘above, at a certain place above’); *betthiye* ‘above it (current, wind)’, ‘down below’, ‘upstream’ or ‘up river’ (north), ‘downstream’ (south), ‘up from shore’, ‘down toward shore’, ‘out to sea or forward’ (into or out to open sea), ‘inside’, ‘outside’. This set of terms are very similar to the corresponding ones in Eipo. Most of the concepts are related to lakes or rivers, more precisely, particularly those around Cold Lake. Related languages such as Carrier, Eyak, Hupa, Koyukon, Navajo, Slavey, and Tlingit also encode spatial concepts based on the immediate environment, such as rivers they traveled to, e.g., for fishing.<sup>201</sup> As we shall demonstrate below, Dene behaves similarly to its neighbor cousins. Table 2.10 presents some of the affiliated languages, Tlingit,<sup>202</sup> Carrier, Koyukon, and Hupa and some of their spatial concepts that are similar to those in Dene.<sup>203</sup>

<sup>200</sup>Li 1946, Cook 2004a.

<sup>201</sup>Leer 1989.

<sup>202</sup>See Thornton 2011, 275–289.

<sup>203</sup>Leer 1989, 613, 622, see also Kari 2011, 239–260; the following abbreviations are used: all = allative; loc = locative; abl = ablative case, suf = suffix.

Tlingit	Carrier (all, loc, abl)	Koyukon (all, areal)	Hupa (loc, suf)
<i>ké-</i> 'up above'	<i>-do, -doh, -des</i> 'up above, over'	<i>-dege, -degu</i> 'up above'	<i>-dah, -de</i> 'up'
<i>ye-, ya-</i> 'down below'	<i>yo-, -yoh, -yes</i> 'down, underneath'	<i>-yege, -yegu</i> 'down below'	<i>-yah, -ya</i> 'down'
<i>naka</i> (north) 'upstream (north-east)'	<i>-nu?, -nud, -nuz</i> 'upstream, away up (from the outlet of a lake)'	<i>-na'e, -nuye</i> 'upstream, back behind, to the rear'	<i>-nage, -nah-</i> 'upstream (south-east)'
<i>-?ix-ka</i> 'downstream (south)'	<i>-da?, -dad, -daz</i> 'downstream'	<i>-do', -duye</i> 'downstream'	<i>-de?, -da-</i> 'downstream (north-west)'
<i>-dag</i> 'up from shore, interior'	<i>-no, -noh, -nes</i> 'north'	<i>-nege, -negu</i> 'up from shore, up on or above shore (from water), toward back (of house)'	<i>-dage, -dah</i> 'away from the stream (north-east)'
<i>yeg, ?ig</i> 'down toward shore'	<i>-cen, -cid, -ciz</i> 'down toward a body of water'	<i>-ene, -uye</i> 'down to shore, toward front (of house)'	<i>-ce?ne, -sen-</i> 'toward the stream, downhill (south-west)'
<i>de-ka</i> 'out to sea, out into open'	<i>-nes, -nes</i> 'forward'	<i>-nela, -nelye</i> 'ahead, out on open water'	
<i>yan</i> 'across, on the other side (of water)'	<i>-ni?, -nid, -niz</i> 'behind, in the rear, away from a body of water'	<i>-nane</i> 'across, on the other side (of water)'	<i>-mane, -?an-</i> 'across the stream (south-west)'
<i>-nel</i> 'inside'	<i>-yan, -yad, -yaz</i> 'on the opposite side (of the water)'		
<i>gán</i> (north) 'outside'	<i>-?en, -?ad, -?az</i> 'away, off'	<i>-?ene, -?uye</i> 'off to the side, away'	<i>-?a, -?a</i> 'beyond, on the other side'

Table 2.10: Environmental spatial concepts in Tlingit, Carrier, Koyukon, and Hupa

It is not necessary to present a detailed analysis of every spatial morpheme in the different languages here. What is evident, and striking, with respect to the subject of this chapter is that in all these languages, spatial marking is aligned to some environmental landmark, i.e., house ('toward or back to the house'), water or river (*des* in Dene; up- or downstream). In addition, the direction of the water is paralleled with cardinal directions as in Hupa. The

examples further indicate a striking similarity to the Dene data. Like the affiliated languages, Dene bases its orientation also on environmental landmarks, but additionally uses the cardinal system (*sayesi* ‘East from under the Sun’; *-da, yethda* ‘The Great Bear constellation’). For example, the North, *yatthé*, profiled also ‘up’ (cf. *tthi* ‘in the north’; *yatthi* ‘to the north’; *ghadhe* ‘the West’; *dási* ‘west’, ‘from down river’, ‘to the west of’). The direction of the wind (*betthiye* [up current], above it (current, wind)) is also marked by the cardinal direction, i.e., *tthisniltsi* is ‘wind from the North’ and *nasniltsi* encodes the ‘wind from the South’. The Dene today even possess the concept of North and South poles (*yatthé néné laghil* and *nil holaghe*, respectively).

More precisely, the Dene Chipewyan territory was strictly limited by the water systems, i.e., large streams and numerous lakes, but also by extensive swamps, prairies, barren areas, and forest.<sup>204</sup> The main limitations were the water systems as can be seen in the following expressions in Dene delimiting the territory. *Kechagha-hotinne* ‘down-stream they-dwell’ is placed west and south-west of Great Slave Lake, near the mouth of Hay River along Mackenzie River, and the lower course of Liard River.<sup>205</sup> The expression *Kai-theli-ke-hotinne* means something like ‘willow flat-country up they-dwell’. This region is centered around the western end of Athabaska lake at Fort Chipewyan and extends northward to Fort Smith on Slave River and southward to Fort McMurray on Athapaskan River.<sup>206</sup> *Kes-ye-hotinne* ‘aspen house they dwell’ encodes a place near the head of the Churchill River system (Lac Isle la Crosse, Portage la Loche, Cold Lake, Heart Lake, Onion Lake). *Háthé-hotinne* ‘lowland they-dwell’ is the region of Reindeer Lake draining southward into Churchill River. *Sa-yísi-dene* ‘Sun under (the eastern) people’ is in the barrens between Reindeer lake, Hudson Bay, and Chesterfield Inlet. *Tanzán-hotinne* is on the northern shore of Great Slave Lake along the Yellowknife River (*Deni-nu-eke-tówe* ‘moose island up lake-on’). The *Hlichá-dene* are the ‘dog flank people’ (Dogrib) between Great Slave Lake, Great Bear Lake, and La Martre and Coppermine River.

With respect to deictic information, as seen for Eipo above, Hopi as a very distant cousin language of the Athapaskan language family presents for all three distances ‘here’, ‘there’, ‘over there’ in the example below, but expands the deictic system into a more refined pattern including medial information (which is known from Dene as well).<sup>207</sup> Note that the basic space structure in Hopi is based threefold on the following case system: a locative, a destinate, and an ablative determine the place or site, destination, and point of origin.<sup>208</sup> Hence, a clear linguistic division via spatial deixis markers and general orientation is encoded as in Eipo and Dene Chipewyan. This is clearly an indication of a high degree of specificity in spatial semantics.<sup>209</sup> Hopi separates this deictic space into a four-way matrix such as *ya-ng* ‘here’ (proximal), *a-* (medial), *e-p/pa-* ‘there’ (distal), and *ay* ‘over there’ (extreme-distal).<sup>210</sup> Note that the morpheme *da-* means something like close to the respective ‘here’, but not as far away as ‘there’, ‘here and there’ (cf. *deira, doro, दौरा* in Eipo).<sup>211</sup>

<sup>204</sup> Curtis 1976, 3.

<sup>205</sup> Curtis 1976, 5.

<sup>206</sup> Curtis 1976, 3.

<sup>207</sup> Thiering 2006.

<sup>208</sup> Malotki 1979, 23, 84.

<sup>209</sup> Thiering 2013.

<sup>210</sup> Malotki 1979, 27, 59, 145.

<sup>211</sup> Malotki 1983, 16.

Central to any analysis of spatial configuration are the linguistic coordinates that dissect the area taken up by the speaker (first person), the hearer (second person), and the persons or things other than the speaker and hearer (third person). English basically structures the terrain occupied by these entities into ‘here’ and ‘there’. Formally adverbs, the semantic thrust of ‘here’ and ‘there’ is deictic, with ‘here’ indicating a point in the immediate vicinity of the speaker and ‘there’ selecting one further removed from him.

A more detailed account of Dene will reveal even more about the interaction between environmental landmarks and its representation in language as we have just shown above in Eipo. The following examples present very basic directional locative markers in Dene.

---

<i>(ne)ja</i>	‘here’
<i>?eyer</i>	‘there’
<i>yughé</i>	‘over there’
<i>ekozi</i>	‘near there’
<i>hoch’a zi</i>	‘away from there/it (time, place)’
<i>-k’ezi</i>	‘over’; ‘out on’ (lake, hill, prairie, flat surface)
<i>nizi</i>	‘in presence of’ (close proximity)
<i>yuwé nigha</i>	‘go (over there)’ (verb) ‘You go over there.’
<i>-thethe</i>	‘above’, ‘over’
<i>nadaghe</i>	‘in front of’
<i>náhésja</i>	‘go’ (start across) ‘I started across’
<i>náhédél</i>	‘go’ (start across) ‘They (plural) started across.’
<i>náhélgé</i>	‘go’ (start across) (animal) ‘He has started across.’
<i>nalé</i>	‘in sight of’ (person, at a distance)
<i>nidhá</i>	‘far’; ‘It is far.’
<i>nidháíle</i>	‘near’; ‘close by’
<i>nu tedhe</i>	‘over us’ (dual and plural)
<i>-thethe</i>	‘above’, ‘over’
<i>ho tedhe</i>	‘unspecified area’
<i>be tedhe</i>	‘person’; ‘thing over a person or something’
<i>se tedhe</i>	‘over me’; ‘above’, ‘over my head’, (metaphorically) ‘I do not understand.’
<i>nu tedhe</i>	‘over us’ (dual and plural)
<i>ni dúe</i>	‘standing close together’
<i>-gáh</i>	(literally) ‘close’, ‘near’
<i>hube tedhe</i>	‘over them’ (plural)
<i>t’ázi</i>	‘behind’ (‘going the other way’); ‘leaning against’; <i>ne-t’azi</i> ‘behind your back’
<i>tanizi</i>	‘center’, ‘middle’
<i>tajáhai</i>	‘in the middle of the lake.’
<i>t’abábel</i>	‘near the shore line’

---

Table 2.11: Basic directional locatives in Dene Chipewyan

These selected examples indicate that Dene Chipewyan (and also Hopi) exhausts a large range of spatial concepts, depending also on environmental landmarks, e.g., lakes in these examples. Additionally, distances are specified, as mentioned before, in a threefold system encoding proximal, medial, and distal relationships between the figure and ground. Those are only approximate distances not relying on exact geometrical or mathematical concepts.

Beside these obvious spatial concepts profiling certain spatial configurations, the next data set presents a case that focuses on truly environmental landmarks. An initial word count in the Elford dictionary of the noun ‘water’ and related constructions presents 199 hits for water alone. The aggregate ‘ice’ yields about 70 hits.<sup>212</sup>

---

<i>ten</i>	‘ice’
<i>ten deteni</i>	‘ice’ (thick) (noun/verb) ‘The ice is thick.’
<i>ten déch’el</i>	‘cracked ice’ (verb) ‘The ice is cracked (with one big crack).’
<i>ten dziré’lii</i>	‘ice’ (drifting) (noun)
<i>ten elt’t’aghidzeghi</i>	‘iceberg’ (noun)
<i>ten héltál</i>	‘cracked ice’ (verb) ‘The ice is cracked (with one small crack).’
<i>ten hóeni</i>	‘dangerous’ (verb) ‘The ice is dangerous.’
<i>ten húlár</i>	‘float’ (verb) ‘Ice floated past.’ <i>ten nádhitleni</i> ‘icicle’ (noun)
<i>ten nádénitthel</i>	‘chop ice (to carve a way)’ (verb) ‘He chopped ice away.’
<i>ten nágheltal</i>	‘crack (ice)’ (verb) ‘The ice is cracked (with many small cracks).’
<i>ten náthelá</i>	‘float’ (verb) ‘Ice lifted or floated up.’
<i>ten nithelár</i>	‘float’ (verb) ‘Ice (large pan) floated to shore and out again.’
<i>ten táthedzegh</i>	‘float’ (verb) ‘Ice floated to shore.’
<i>táthela; ten táthelar</i>	‘float’ (verb) ‘Ice (large pan) floated to shore.’
<i>ten táthelár</i>	‘float’ (verb) ‘Ice lifted or floated up.’
<i>ten táthi</i>	‘float’ (verb) ‘Ice is floating (to shore).’
<i>ten ts’et’ani</i>	‘ice (thin)’ (noun) not accessible
<i>ten tsele</i>	‘ice (fall)’ (noun) not accessible
<i>ten ts’ili</i>	‘ice (spring)’ (noun) not accessible

---

Table 2.12: Variation of ‘ice’ in Dene Chipewyan

The above set of examples of various linguistic constructions encoding different qualities of ‘ice’ neatly complements the Eipo data on ‘river’ as an important landmark. During the fishing season, the Dene needed to know the specific qualities of ice, e.g., its thickness. Ice fishing necessitated the exact knowledge of a location where the ice was thin enough to drill a hole and which was at the same time above the fish grounds. Note that in Dene most of the above-quoted linguistic constructions are, nowadays, used only by a few fluent elders. It can be assumed that in a generation from now, most of the constructions will be gone.<sup>213</sup>

<sup>212</sup>See also ‘river’ = 22, ‘lake’ = 31 (as opposed to ‘mountain’ = 3), ‘land’ = 37; ‘shore’ = 6; ‘fish’, ‘fishing’ = 106.

<sup>213</sup>Thiering 2009a, Thiering 2010.

## 2.7 Conclusion

This chapter has presented aspects of spatial cognition reflected in two unrelated languages and cultures. The interrelation of culture, environment, and language has been shown for Dene Chipewyan and Eipo. Some aspects of spatial cognition turned out to be culture specific, being shaped, for instance, by practices of spatial orientation and organization. Thus, depending on the practical and environmental contexts, we found differing degrees of specificity in the different cultures.

Arguably, language here plays a double role as an external representation or semiotic system, on the one hand throwing light on structures of cognition and on the other shaping cognition and influencing its structure. On the basis of the study of a sample of two unrelated cultures and utterances in their languages, the chapter attempted to distinguish aspects of spatial cognition. Some might be candidates for universals although they may find different expressions in different languages. It is impossible, of course, to draw inferences from a sample of just two languages, but in the broader context of this book, it appears obvious that certain non-linguistic features of spatial thinking shape spatial language and practice in all societies. An example is the figure-ground asymmetry as a fundamental structure of spatial cognition.<sup>214</sup>

Aspects of spatial topography have been shown that are truly culture specific in the sense that different cultures develop different cognitive structures. Examples have been provided by deixis and other references to and conceptualizations of space. Moreover, the current chapter presented cultural and language specific *ideas of space* of Eipo and Dene Chipewyan (and some selected from other languages such as Hopi). Such spatial concepts have been shown to be of crucial importance in the two ethnic groups and related cousin languages. People in both cultures lived in complex environments, traveled long distances into dangerous terrain and usually made their way back safely. Survival in their habitats depended on evolved capacities typical for our species to efficiently manage orientation in space. Moreover, it depended on ontogenetic learning about the geography of the environment with its many specific features and on a culturally transmitted, linguistically encoded spatial reference system sufficiently precise to foster the process of forming mental maps of their land.

We have provided linguistic information about the encoding of such spatial concepts. These concepts are topography-based and related to environmental landmarks. These landmarks can be mountains or rivers and lakes. The concepts are also based on one's own experience when walking to and returning from various distant places. These individual experiences are made in the context of culture-specific practices and techniques which therefore shape the spatial concepts. Examples of such practices and techniques are the making of gardens, hunting and snaring in high altitude and the partly ritualized process of building a men's house in the society of the Eipo or hunting in the society of the Dene. These practices embody culturally shared knowledge and, at the same time, reflect the environmental affordances.

As for other cultures, spatial classification in Eipo and Dene involves locating the objects, i.e., defining places is basically delimitating, based on the environment. Speakers parse up their environment into an important and necessary topography or spatial matrix. This is represented in the language via mountain, river, and place names. The description

<sup>214</sup>See, however, Thiering 2011.

of such components, as Malotki rightfully points out, should include anthropological and cultural aspects of the language.<sup>215</sup> One of the main empirical sources we have for Eipo and Dene are the oral traditions as transmitted in their myths. These myths function as a chronological topology of places.

Certain practices, habits, and environmental landmarks clearly have repercussions on language (as shown in some selected linguistic examples). Hence, our research on Amerindian and Mek languages corroborates some insights from early nineteenth and twentieth-century scholars such as Franz Boas, Edward Sapir, and Benjamin Lee Whorf (and contemporary scholars such as Helmut Gipper and Ekkehart Malotki). Those insights were built on Humboldt's idea of *Weltansichten* 'world perspectives', i.e., the idea that the structure of language influences the thought process. In North America, this concept is known as the linguistic relativity principle or Sapir-Whorf theory. We subscribe to the idea that languages differ in the way they shape our world perspectives, but believe that non-linguistic information has its impact upon spatial language and categorization. Hence, our current research aimed to show the ideas of space ('Raumbilder') as a web of intertwined interaction of language, culture, and cognition.

The following quote by Heeschen summarizes the impact of non-linguistic, e.g., environmental, cultural etc., information on language, in this case the Mek language.<sup>216</sup>

The importance of reference to space, the social context of giving and taking, and references to non-verbal communication shape the content of the vocabulary. The characteristics and peculiarities of everyday interaction and speech follow from the fact that speech is complemented by, and related to, other semi-otic systems.

We subscribe to Heeschen's point of view with respect to the reference to space and its relation to semiotic systems. We have presented language data showing the influence and constructive process of environmental landmarks and cultural heritage on shaping of spatial categorization in the two languages.

Finally, we hope we have shown that spatial knowledge is embedded in cultural and linguistic practices. This was outlined above as our guiding principle, i.e., that spatial knowledge is not only encoded in mental concepts, but also embodied in the lived histories of human beings. These histories are represented by cultural and linguistic practices. Hence, our concept presented at the beginning of this chapter arguing in favor of an influence of non-linguistic information upon spatial language and categorization has been shown to apply. The points taken from the selected empirical data indeed indicate the influence and even constructive process of environmental landmarks and cultural heritage on the shaping of spatial categorization in the two languages.

---

<sup>215</sup>Malotki 1979, 301.

<sup>216</sup>Heeschen 1998, 381.

### List of linguistic abbreviations

ADV	adverb	MOM	momentaneous
CLASS	classifier	PKT	punctive
DIF	diffusive	PL	plural
DUR	durative	PP	post position
FUT	future	PRES	present
HAB	habitual	PRON	pronoun
HORT	hortative or optative	S	subject
INCORP	incorporation	SG	singular
ITER	iterative	VN	verbal noun
MED	sentence medial verb		

Table 2.13: List of linguistic abbreviations used in this chapter

### Bibliography

- Ameika, F. (2006). Elements of the grammar of space in Ewe. In: *Grammars of Space*. Ed. by D. Wilkins S. Levinson. Cambridge: Cambridge University Press, 359–399.
- Bechtel, William and Adele Abrahamsen (1991). *Connectionism and the Mind: An Introduction to Parallel Processing in Networks*. Cambridge, MA: Blackwell.
- Berthele, Raphael (2006). *Ort und Weg. Die sprachlichen Raumreferenzen in Varietäten des Deutschen, Rätoromanischen und Französischen*. Berlin: de Gruyter.
- Birbaumer, Niels and Robert Schmidt, eds. (1993). *Lernen und Gedächtnis. Neuro- und Sinnesphysiologie*. Springer.
- Blum, Paul, Irenäus Eibl-Eibesfeldt, Volker Heeschen, Klaus Helfrich, Gerd Koch, Thomas Michel, Grete Schiefenhövel, Wulf Schiefenhövel, Artur Simon, Franz Simon, and Sven Walter (1979–1996). *Eipo (West-Neuguinea, Zentrales Hochland)*. DVD, IWF Wissen und Medien, Göttingen.
- Boas, Franz (1977). *Handbook of American Indian Languages, Part I*. reprint of the 1911 edition. London: Routledge/Thoemmes Press.
- Bodley, John H. (1999). Hunter-gatherers and the colonial encounter. In: *The Cambridge Encyclopedia of Hunters and Gatherers*. Ed. by Richard B. Lee and Richard Daly. Cambridge: Cambridge University Press, 465–472.
- Brody, Hugh (1982). *Maps and Dreams*. New York: Pantheon.
- Brown, Cecil H. (1983). Where Do Cardinal Direction Terms Come From? *Anthropological Linguistics* 25(2):121–161.
- Buschmann, J. C. E. (1855). Der athapaskische Sprachstamm. In: *Königliche Akademie der Wissenschaften zu Berlin, Abhandlungen aus dem Jahre 1855*, 144–319.
- Bußmann, Hadumod (2008). *Lexikon der Sprachwissenschaft*. Stuttgart: Kröner.
- Carlson, Laura (1999). Selecting a reference frame. *Spatial Cognition and Computation* 1(4): 365–379.

- (2000). Object use and object location. The effect of function on spatial relations. In: *Cognitive Interfaces Constraints On Linking Cognitive Inform.* Ed. by Emile Van Der Zee and Urpo Nikanne. Oxford: Oxford University Press, 94–115.
  - (2003). Using spatial language. In: *Psychology of Motivation: Advances in Research and Theory.* Ed. by Aaron S. Benjamin and Brian H. Ross. San Diego, CA: Academic Press, 127–161.
- Carlson, Laura and Gordon Logan (2001). Using spatial terms to select an object. *Memory and Cognition* 29:883–892.
- Carlson-Radvansky, Laura (1993). Frames of reference in vision and language: Where is above? *Cognition* 46:223–244.
- Carlson-Radvansky, Laura and Gabriel Carlson-Radvansky (1996). The influence of functional relations on spatial term selection. *Psychological Science* 7:56–60.
- Carter, Robin M. (1976). Chipewyan Classificatory Verbs. *International Journal of American Linguistics* 42(1):24–30.
- Cook, Eung-Do (2004a). *A Grammar of Dene Suline (Chipewyan)*. Algonquian and Iroquoian Linguistics. Winnipeg, Manitoba: Algonquian and Iroquoian Linguistics.
- (2004b). Athapaskan classificatory verbs. *Amerindia, Revue d'Ethno-linguistique amérindienne*( 11):11–24.
- Coventry, Kenny R. and Simon C. Garrod (2004). *Saying, Seeing and Acting. The Psychological Semantics of Spatial Prepositions*. Hove/New York: Psychology Press.
- Curtis, Edward S. (1976). *The North American Indian. Vol. 18, The Chipewyan. The Western Woods Cree. The Sarsi.* reprint. New York: Johnson.
- Davidson, William L., William Elford, and Harry Hoiyer (1963). Athapaskan classificatory verbs. In: *Studies in the Athapaskan Languages*. Ed. by Harry Hoiyer et al. Berkeley: University of California Press, 30–41.
- Downs, Roger and David Stea, eds. (1973). *Image and Environment: Cognitive Mapping and Spatial Behavior*. Chicago: Aldine.
- Edelman, Shimon (2002). Constraining the neural representation of the visual world. *Trends in Cognitive Science* 6:125–131.
- Eibl-Eibesfeldt, Irenäus (1995). *Eipo (West-Neuguinea, Zentrales Hochland). Männertanz 'sang mote' als Kinderspiel*. DVD. Produktionsjahr: 1979 IWF Bestellnummer/Bandzählung: E 2686.
- Eibl-Eibesfeldt, Irenäus, Wulf Schiefenhövel, and Volker Heeschen (1991). Film- und Tonaufnahmen bei den Eipo, Neuguinea. Zur Methodik der Datenerhebung und Auswertung. *Wissenschaftlicher Film* 42.
- Foley, William A. (1986). *The Papuan Languages of New Guinea*. New York: Cambridge University Press.
- (1997). *Anthropological Linguistics: An Introduction*. Oxford: Blackwell.
- Fowler, Catherine and Nancy Turner (1999). Ecological/Cosmological Knowledge and Land Management among Hunter-Gatherers. In: *The Cambridge Encyclopedia of Hunters and Gatherers*. Ed. by Richard B. Lee and Richard Daly. Cambridge: Cambridge University Press, 419–425.
- Geertz, Clifford (1999). *The Interpretation of Cultures. Selected Essays*. New York: Basic Books.
- Gentner, Dedre and Albert Stevens, eds. (1983). *Mental Models*. Hillsdale: Erlbaum.

- Gladwin, Thomas (1974). *East is a Big Bird. Navigation and Logic on Puluwat Atoll*. Cambridge, MA: Harvard University Press.
- Heeschen, Volker (1990). *Ninye bün. Mythen, Erzählungen, Lieder und Märchen der Eipo (im zentralen Bergland von Irian Jaya, West-Neuguinea, Indonesien)*. Mensch, Kultur und Umwelt im Zentralen Bergland von West-Neuguinea 20. Berlin: Reimer.
- (1992). The Position of the Mek Languages of Irian Jaya among the Papuan Languages: History, Typology, and Speech. *Bijdragen tot de Taal-, Land- en Volkenkunde* 148(3): 465–488.
- (1998). *An Ethnographic Grammar of the Eipo Language. Spoken in the Central Mountains of Irian Jaya (West New Guinea), Indonesia*. Berlin: Reimer.
- Heeschen, Volker and Wulf Schiefenhövel (1983). *Wörterbuch der Eipo-Sprache. Eipo-Deutsch-Englisch*. Mensch, Kultur und Umwelt im zentralen Bergland von West-Neuguinea 6. Berlin: Reimer.
- Hillert, Dieter (1987). *Zur mentalen Repräsentation von Wortbedeutungen. Neuro- und psycholinguistische Überlegungen*. Tübingen: Narr.
- (1992). *Sprachprozesse und Wissensstrukturen*. Opladen: Westdeutscher Verlag.
- Hofstadter, Douglas R. (1980). *Gödel, Escher, Bach: An Eternal Golden Braid*. New York: Vintage.
- Hoiyer, Harry (1946). Introduction. In: *Linguistic Structures of Native America*. Ed. by Cornelius Osgood. Viking Fund Publications in Anthropology 6. New York: Viking Fund, 9–29.
- (1951). Cultural implications of some Navaho linguistic categories. *Language* 27(2): 111–120.
- Hunt, Earl and Franca Agnoli (1991). The Whorfian hypothesis. A cognitive psychology perspective. *Psychological Review* 98(3):377–389.
- Hutchins, Edwin (1983). Understanding Micronesian Navigation. In: *Mental Models*. Ed. by Dedre Gentner and Albert L. Stevens. Hillsdale: Erlbaum, 191–225.
- (1996). *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Johnson-Laird, Philip Nicholas (1983). *Mental Models. Towards a Cognitive Science of Language, Inference, and Consciousness*. Cambridge, MA: Harvard University Press.
- Kandel, Eric and Richard Hawkins (1994). Molekulare Grundlagen des Lernens. In: *Gehirn und Bewußtsein*. Heidelberg: Spektrum, 114–124.
- Kari, James (1979). *Athabaskan Verb Theme Categories: Ahtna*. Alaska Native Language Center Research Papers 2. Fairbanks: University of Alaska.
- (2011). A case study in Ahtna Athabaskan geographic knowledge. In: *Landscape in Language: Transdisciplinary Perspectives*. Ed. by David M. Mark, Andrew J. Turk, Niclas Burenhult, and David Stea. Amsterdam: Benjamins.
- King, David and M. Bathgate (s.d.). Population of Papua New Guinea. In: *Papua New Guinea Atlas: A Nation in Transition*. Ed. by David King and Stephen Ranck. R. Brown and Associates in conjunction with the University of Papua New Guinea, 20–21.
- Knauff, Markus (2013). *Space to Reason: A Spatial Theory of Human Thought*. Cambridge, MA: MIT Press.
- Koch, Gerd (1984). *Maligdam. Ethnographische Notizen über einen Siedlungsbereich im oberen Eipomek-Tal, zentrales Bergland von Irian Jaya, West-Neuguinea, Indonesien*. Mensch, Kultur und Umwelt im Zentralen Bergland von West-Neuguinea 15. Berlin: Reimer.

- Koch, Gerd and Wulf Schiefenhövel (2009). *Eipo (West-Neuguinea, Zentrales Hochland) - Neubau des sakralen Männerhauses in Munggona*. DVD. Produktionsjahr: 1974, first published in 1979; IWF Bestellnummer/Bandzählung E 2475.
- Koffka, Kurt (1935). *Principles of Gestalt Psychology*. New York: Harcourt.
- Komando Daerah Militer XVII “Cenderawasih” (1969). *Laporan ekspedisi ilmiah lembah-X, 2 Okt. sampai dengan 20 Des. 1969 di Irian Barat*. [Report on the scientific expedition into the Valley of the X-River from 2 October 20 December 1969 in West-Irian]. Mimeograph.
- Kuipers, B. (1982). The “map in the head” metaphor. *Environment and Behaviour* 14:202–220.
- Langacker, Ronald W. (1987). *Foundations of Cognitive Grammar. Vol. I: Theoretical Prerequisites*. Stanford: Stanford University Press.
- (2008). *Cognitive Grammar: A Basic Introduction*. New York: Oxford University Press.
- Leer, Jeff (1989). Directional systems in Athapaskan and Na-Dene. In: *Athapaskan Linguistics. Current Perspectives on a Language Family*. Ed. by Eung-Do Cook and Keren Rice. Berlin: Mouton de Gruyter, 575–622.
- Levinson, Stephen C. (2003). *Space in Language and Cognition. Exploration in Cognitive Diversity*. Cambridge: Cambridge University Press.
- Levinson, Stephen C. and David Wilkins, eds. (2006). *Grammars of Space*. Cambridge: Cambridge University Press.
- Lewin, Kurt (1936). *Principles of Topological Psychology*. London. McGraw Hill.
- Li, Fang-Kuei (1946). Chipewyan. In: *Linguistic Structures of Native America*. Ed. by Cornelius Osgood. Viking Fund Publications in Anthropology 6. New York: Viking Fund, 398–423.
- Louwerse, Jan (1978). A tentative Una phonology. *Irian* 7(3):43–90.
- (1988). *The Morphosyntax of Una in Relation to Discourse Structure: A Descriptive Analysis*. Pacific Linguistics 100. Canberra: Australian National University.
- Lucy, John A. (1992a). *Grammatical Categories and Cognition: A Case Study of the Linguistic Relativity Hypothesis*. Studies in the social and cultural foundations of language 13. Cambridge: Cambridge University Press.
- (1992b). *Language Diversity and Thought: A Reformulation of the Linguistic Relativity Hypothesis*. Studies in the social and cultural foundations of language 12. Cambridge: Cambridge University Press.
- Malotki, Ekkehart (1979). *Hopi-Raum: Eine sprachwissenschaftliche Analyse der Raumvorstellungen in der Hopi-Sprache*. Tübingen: Narr.
- (1983). *Hopi Time. A Linguistic Analysis of the Temporal Concepts in the Hopi Language*. Berlin: Mouton de Gruyter.
- Mark, David M., Andrew J. Turk, Niclas Burenhult, and David Stea, eds. (2011). *Landscape in Language: Transdisciplinary Perspectives*. Amsterdam: Benjamins.
- Marr, David (1982). *Vision: A Computational Investigation in the Human Representation of Visual Information*. San Francisco: Freeman.
- McDonough, Joyce (2000). On a bipartite model of the Athabaskan verb. In: *The Athabaskan Languages*. Ed. by Theodore B. Fernald and Paul R. Platero. Oxford: Oxford University Press, 139–166.
- Michel, Thomas (1983). *Interdependenz von Wirtschaft und Umwelt in der Eipo-Kultur von Moknerkon. Bedingungen für Produktion und Reproduktion bei einer Dorfschaft im*

- zentralen Bergland von Iran Jaya, West-Neuguinea, Indonesien. Mensch, Kultur und Umwelt im zentralen Bergland von West-Neuguinea* 11. Berlin: Reimer.
- Miller, George A. and Philip Nicholas Johnson-Laird (1976). *Language and Perception*. Cambridge: Cambridge University Press.
- Morice, A. G. (1890). The Déné Languages (Considered in Themselves and Incidentally in their Relations to Non-American idioms). In: *Transaction of the Canadian Institute*. 1, 170–212.
- Murre, Jacob M.J. and Rainer Goebel (1996). Connectionist modeling. In: *Computational Psycholinguistics*. Ed. by Tom Dijkstra and Konrad De Smedt. London: Taylor and Francis, 49–81.
- Nunberg, Geoffrey (1978). *The Pragmatics of Reference*. Bloomington: Indiana University Linguistics Club.
- Penrose, Roger (1991). *Computerdenken: Die Debatte um künstliche Intelligenz, Bewußtsein und die Gesetze der Physik*. Heidelberg: Spektrum.
- Piaget, Jean and Bärbel Inhelder (1956). *The Child's Conception of Space*. London: Routledge & Kegan Paul.
- Portugali, Juval, ed. (1996). *The Construction of Cognitive Maps*. Dordrecht: Kluwer.
- Pouwer, J. (1964). Social System in the Star Mountains, towards a Reorientation of the Study of Social Systems. *American Anthropologist* 66(4):133–161.
- Rice, Keren (1989). *A Grammar of Slave*. Berlin: Mouton de Gruyter.
- Rice, Sally (1996). Prepositional prototypes. In: *The Construal of Space in Language and Thought*. Ed. by Martin Pütz. Berlin: Mouton de Gruyter, 135–165.
- (1997). Giving and taking in Chipewyan: The semantics of THING-marking classificatory verbs. In: *The Linguistics of Giving*. Ed. by John Newman. Philadelphia: Benjamins, 97–134.
- (2002). Posture and existence predicates in Dene Suline (Chipewyan): Lexical and semantic density as a function of the 'stand'/'sit'/'lie' continuum. In: *The Linguistics of Sitting, Standing, and Lying*. Ed. by John Newman. Philadelphia: Benjamins, 61–78.
- Ritter, H., T. Martinetz, and K. Schulten (1991). *Neuronale Netze. Eine Einführung in die Neuroinformatik selbstorganisierender Netzwerke*. Bonn: Addison-Wesley.
- Röll, Werner and Gerd Zimmermann (1979). *Untersuchungen zur Bevölkerungs-, Siedlungs- und Agrarstruktur im zentralen Bergland von Irian-Jaya, West-Neuguinea, Indonesien. Mensch, Kultur und Umwelt im zentralen Bergland von West-Neuguinea* 1. Berlin: Reimer.
- Rubin, Edgar (1921). *Visuell wahrgenommene Figuren*. Copenhagen: Gyldendalske.
- Sapir, Edward (1915). The Na-Dene Languages, a Preliminary Report. *American Anthropology* 17(3):534–558.
- Sarfert, E. (1911). Zur Kenntnis der Schiffahrtskunde der Karoliner. *Korrespondenzblatt der Deutschen Gesellschaft für Anthropologie, Ethnologie, und Urgeschichte* 42:131–136.
- Schade, Ulrich (1992). *Konnektionismus: Zur Modellierung der Sprachproduktion*. Opladen: Westdeutscher Verlag.
- Schiefenhövel, Wulf (1976). Die Eipo-Leute des Berglands von Indonesisch-Neuguinea: Kurzer Überblick über den Lebensraum und seine Menschen. Einführung zu den Eipo-Filmen des Humanethnologischen Filmarchivs der Max-Planck-Gesellschaft. *Homo* 26(4):263–275.

- (1979). The Eipo: Members of the Mek group in the Highlands of Irian Jaya. *Irian, Bulletin of Irian Jaya Development* VII(2):47–67.
  - (1991). Die Mek und ihre Nachbarn. Internationale Konferenz über Neuguinea-Forschungen. *Zeitschrift für Wissenschaft und Forschung* 91(1):21–25.
  - (2001). Kampf, Krieg und Versöhnung bei den Eipo im Bergland von West-Neuguinea: Zur Evolutionsbiologie und Kulturanthropologie aggressiven Verhaltens. In: *Begegnung und Konflikt eine kulturanthropologische Bestandsaufnahme*. Ed. by Wolfgang Fikentscher. Bayrische Akademie der Wissenschaften, Philologisch-Historische Klasse, Abhandlungen 120. München: Beck, 169–186.
- Schreuder, Robert and Giovanni B. Flores d’Arcais (1989). Psycholinguistic issues in the lexical representation of meaning. In: *Lexical Representation and Process*. Ed. by William D. Marslen-Wilson. Cambridge, MA: MIT Press, 409–436.
- Senft, Gunter, ed. (2000). *Systems of Nominal Classification*. Cambridge: Cambridge University Press.
- Siegel, Alexander W. and Sheldon H. White (1975). The Development of Spatial Representation of Large-Scale Environments. In: *Advances in Child Development and Behavior*. Ed. by Hayne W. Reese. New York: Academic Press.
- Simon, Franz and Wulf Schiefenhövel (1989). *Eipo (West-Neuguinea, Zentrales Hochland). ‘Mote’, ein Besuchsfest in Munggona*. DVD. Produktionsjahr: 1976 IWF Bestellnummer/Bandzählung: E 2803.
- Sinha, Chris and Tanya Kuteva (1995). Distributed spatial semantics. *Nordic Journal of Linguistics* 18:167–199.
- Smith, James G. E. (1981). Chipewyan. In: *Handbook of North American Indians. Vol. 6: Subarctic*. Ed. by June Helm. Washington: Smithsonian Institution, 271–284.
- Strube, Gerhard, ed. (1996). *Wörterbuch der Kognitionswissenschaft*. Stuttgart: Klett-Cotta.
- Svorou, Soteria (1993). *The Grammar of Space*. Philadelphia: Benjamins.
- Swadling, Pemela (1981). *Papua New Guinea’s Prehistory*. Port Moresby: Gordon & Gotch.
- Sweetser, Eve (1990). *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure*. Cambridge: Cambridge University Press.
- Talmy, Leonard (1978). Figure and Ground in complex sentences. In: *Universals of Human Language*. Ed. by Joseph Harold Greenberg, Charles A. Ferguson, and Edith A. Moravcsik. Stanford: Stanford University Press, 627–649.
- (1983). How to structure space. In: *Spatial Orientation: Theory, Research, and Application*. Ed. by Herbert Pick and Linda Acredolo. New York: Plenum Press, 225–282.
  - (2000). *Towards a Cognitive Semantics, Vols. I and II*. Cambridge, MA: MIT Press.
- Thiering, Martin (2006). *Topological Relations in an Athapaskan Language*. Papers in Experimental and Theoretical Linguistics (Department of Linguistics Working Papers) 1. Edmonton: University of Alberta.
- (2009a). Language loss in spatial semantics: Dene Suliné. In: *Variation in Indigenous Minority Languages*. Ed. by James N. Stanford and Dennis R. Preston. Amsterdam: Benjamins, 485–516.
  - (2009b). *Linguistic Categorization of Topological Spatial Relations*. Preprint 373, Max Planck Institute for the History of Science, Berlin.
  - (2010). *Intralingual Variation of Spatial Concepts in an Athapaskan Language*. LAUD Paper No. 742, Linguistic Agency University of Duisburg-Essen.
  - (2011). Figure-Ground Reversals in Language. *Gestalt Theory* 33(3/4):245–276.

- Thiering, Martin (2012). *Topographical Coordinates and Spatial Language*. LAUD Paper No.770, Linguistic Agency University of Duisburg-Essen.
- (2013). Degrees of specificity in spatial semantics. In: *Variation in Language and Language Use. Linguistic, Socio-Cultural and Cognitive Perspectives*. Ed. by Monika Reif, Justyna A. Robinson, and Martin Pütz. Frankfurt a. M.: Peter Lang, 367–420.
- (2014). Cognitive Maps of Landmark Orientation. In: *Multilingual Cognition and Language Use: Processing and typological perspectives*. Ed. by Luna Filipović and Martin Pütz. Amsterdam: Benjamins, 151–182.
- Thornton, Thomas F. (2011). Language and Landscape among the Tlingit. In: *Landscape in Language: Transdisciplinary Perspectives*. Ed. by David M. Mark, Andrew J. Turk, Niclas Burenhult, and David Stea. Amsterdam: Benjamins.
- Tolman, Edward C. (1948). Cognitive Maps in Rats and Men. *The Psychological Review* 55(4):189–208.
- Watzlawick, Paul (1981). *Die erfundene Wirklichkeit: Wie wissen wir, was wir zu wissen glauben? Beiträge zum Konstruktivismus*. München: Piper.
- Wender, Karl Friedrich (1980). *Modelle des menschlichen Gedächtnisses*. Stuttgart: Kohlhammer.
- Whorf, Benjamin Lee (1956). *Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf*. Cambridge, MA: MIT Press.
- Wurm, Stephen A. (1982). *Papuan Languages of Oceania*. Tübingen: Narr.
- Wygotski, Lev S. (1964). *Denken und Sprechen*. Berlin: Akademie Verlag.
- Young, Robert and William Morgan (1987). *The Navajo Language: A Grammar and Colloquial Dictionary*. Albuquerque: University of New Mexico Press.
- (1992). *Analytical Lexicon of Navajo*. Albuquerque: University of New Mexico Press.
- Zell, Andreas (1994). *Simulation neuronaler Netze*. Bonn: Addison-Wesley.
- Zlatev, Jordan (2003). Holistic spatial semantics of Thai. In: *Cognitive Linguistics and Non-Indo-European Languages*. Ed. by Eugene H. Cassad and Gary B. Palmer. Berlin: de Gruyter, 305–336.