TOPOLOGICAL RELATIONS IN AN ATHAPASKAN LANGUAGE

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1. INTRODUCTION

This paper presents an initial description of spatial topological relations in a Northern Athapaskan language, Dene Sųłiné (formerly known as Chipewyan). I intend to determine the cognitive semantic scope of spatial topological relations—comparable with English *at*, *on*, and *in* relations—by using the *Topological Relations Picture Series* elicitation tool (Pederson, Wilkins, & Bowerman (1998)). Essentially, the semantic field of spatial predications is at issue, as is the question of the role of topological static locations between objects that specify an objective space relying on geometrical/Euclidean grounds.

I will argue that spatial topological relations are not encoded on the basis of purely objective coordinates given by external spatial parameters only. These are generally deemed to be speaker-neutral cross-linguistically. Instead, I suggest that, if spatial language is used in Dene, it is inclined to encode a rather dynamic and perspectivized construal as opposed to a more static and objectivized one.

This paper is in line with the general cognitive linguistic preamble being a usage-based approach to language. Unfortunately, most analyses of spatial topological relations still rely on the assumption that human beings instantiate and designate events in an idealized and speaker-independent construal based on the dimensional and metrical space of Euclidean geometry (Herskovits 1986; Lakoff 1987b; Ruhl 1989; Svorou 1993; Tyler & Evans 2001, 2003). In contrast to this, I will adopt the idea of 'functional concepts' to capture non-linguistic factors that are crucial in the encoding of space (Vandeloise 1991). Vandeloise claims that these concepts are tied to extra-linguistic knowledge of the world shared by the speakers of one's language (1991: 13). He argues that the usual geometric and logical analyses of spatial predications are determined by formal concepts that are independent of context. Instead of proposing idealized models or situations, one has to account for non-spatial factors "that are determined by the context and by the circumstances of the use of the prepositional terms" (Vandeloise 1991: 239). It is argued in this paper that speakers construe space in terms of cultural and individual mental models depending on the basis of ego- and socio-centricity, the fundamental reference objects being the human body, social and cultural determiners (Aitchison 1997: 87; Dutke 1994; Johnson-Laird 1983: 10; 146-166; Levelt 1989: 114; Talmy 1983).

A single morpheme in English expresses spatial topological relations, in particular the prepositions *at*, *on*, and *in*. The encoding of space in Dene indicates that such a single adposition does not give sufficient semantic information of the encoded spatial event. Rather, a combinatory system of a predominant classificatory verb pattern—positional or locational verbs—in addition to directional prefixes encodes the spatial relations as opposed to the semantic load a preposition takes in English or German (Carter 1976; Davidson, Elford & Hoijer 1963; Rice 1997; 2002b; Rice & Wood 1996). Throughout the current research, I will call these classificatory verbs plus prefixes COHORT SYSTEMS[1]. Given the language specific affordances,

these cohorts include the major semantic information in the construction of spatial meaning in speech acts that needs to be lexicalized (Rice & Wood 1996). Hence, they relate the salient participants of a scene in the figure-ground asymmetry. These predicate events generally involve location, free fall or change of location, handling, and caused motion (Rice 1997: 103). Furthermore, we will see the highly dense degree of lexicalization and specificity in Dene implying the necessity to express all participants in a highly specific mode (Svorou 1993).

This description of spatial relations is based on Vandeloise's usage-based framework to indicate the dynamic and perspectivized construal of the figure-ground asymmetry as opposed to rather static descriptions of space as done in earlier research on prepositions (Herskovits 1986; Lakoff 1987a,b; Tyler & Evans 2001, 2003). The taxonomy used in this analysis is provided by Talmy's cognitive semantic categories. They play a significant part to attribute the primary and secondary objects of a scene as the "distinct referencing functions" (1983: 230). These "functions" are encoded by the figure and ground of a scene—the variable element or positive space as opposed to the reference element or negative space (Hofstadter 1980; Talmy 1978, 1983, 2000). The former is the moving and smaller entity as opposed to the latter, which serves as the reference object and is larger and permanently located as well (Talmy 1983: 277-78)).

The general point of departure of this paper is that the language system is informed by cognition, and cognition is informed by everyday human experience (Rice 2002b: 64). That there is such an influence and interplay of everyday human experience on language can be supported by the elicited Dene data (see also Levinson 1998; Nuyts & Pederson 1998).

The paper is structured as follows: Section (2) presents theoretical preliminaries, section (3) outlines the rationale and methodology of the elicitation tool, section (4) gives a selected set of the elicited data, section (5) summarizes the current findings, and finally, section (6) provides the bibliography, and (7) appendices.

2. SPATIAL TOPOLOGICAL RELATIONS: A GENERAL OUTLINE

As a division within the cognitive domain, spatial topological relations are defined as locational relations between objects that specify space in general. Such relations are expressed by prepositions in English to encode verticality, e.g., *over*, *under*, *on*, horizontality, e.g., *beside*, *right*, *left* or the inner space, e.g., *in*, *inside* as opposed to the outer space, e.g., *at*. These relations are considered to be universally, i.e., cross-linguistically relevant to linguistic descriptions and they are supposed to be neutral regarding scale, size, orientation, or texture of the involved objects. As opposed to this view, Pederson, Wilkins & Bowerman (1998: 1) point out that these relations should be decomposed into specific characteristic features, such as (+/-) contact, (+/-) inclusion, (+/-) adjacent and functional relations, including (+/-) support and (+/-) containment relations. The Dene data lend support to Pederson et al. features, but additionally, they require even more specific imaging features such as shape, size, material in the relation between primary and secondary objects, and rely also on the animate/non-animate distinction, and functional features of the figure being located.

In general, it is assumed that the physical world is well delineated and unambiguously conceptualizable, made up of objects that are well defined in shape and position in space (Johnson 1987 for an extensive critique on the objectivist view). This truth-conditional paradigm describes language as functioning primarily to denote these concepts. According to this view, what people talk about are these discrete objects and their relations to the world, i.e., the spatial domain would simply be situated in a dimensional coordinate system as proposed by most geometric Euclidean approaches (Herskovits 1986;

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[1] Classificatory verbs are not so much a special case for Athapaskan languages like Dene because we do see in European languages a parallel by the usage of posture verbs, e.g., *sit*, *lay*, *stand*. These verbs encode the figure being in a specific position to the ground. Nevertheless, in Dene we see that the stem changes also in terms of different qualitative features such as size, texture, or shape of the figure. These features are not encoded via posture verbs.

Lakoff 1987b; Ruhl 1989; Svorou 1993; Tyler & Evans 2001, 2003). In linguistics in particular, it has been assumed that the meaning of locational topological expressions can be entirely specified as a proposition construed out of a simple geometric relation applying to the objects. These discrete objects rely on topological or non-topological basic schemas (Rice 1993). As opposed to this view I want to a argue that linguistic knowledge is a product of the human organism in relation to others, hence, it is a social construct.

As pointed out above, the main claim about spatial topological relations is that they depend on the figure-ground asymmetry (Talmy 1978, 1983, 2000; Vandeloise 1991: 29). This asymmetry implies that the figure constitutes new information as opposed to the ground. The figure is the salient movable object—variable element—as opposed to the permanently located ground—the reference element—serving as the more background reference point (Talmy 1978, 1983).

> The figure is a moving or conceptually moveable object whose site, path, or orientation is conceived as a variable the particular value of which is the salient issue. The ground is a reference object (itself having a stationary setting within a reference frame) with respect to which the figure's site, path, or orientation receives characterization (Talmy 1983: 232; see also Talmy 1978: 627).

Three basic factors determine the contrast between figure and ground: the size, movement, and position of the figure in relation to the ground in the shared knowledge of the discourse participants. Talmy states that adpositional phrases in particular 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 (Talmy 2000).

A single physical reality may be conceptualized in many different ways. Each way of conceiving a scene may correspond to a different linguistic description as shown in the sentences below:

(1)   a.   The statue is on the pedestal.
        b.   The pedestal is under the statue.

These two sentences impose different images constructed from the same physical scene (Vandeloise 1991: 44). This idea traces back to Talmy's functional differences of such propositions as in (2).

(2)   a.   The bike is near the house.
        b.   The house is near the bike.

These two sentences are not synonymous and do not have the same meaning, but do represent a certain semantic reality of functional difference (Talmy 1978: 628ff., 1983: 231). In (2a), the ground—*house*—is the fixed point as opposed to the moving figure—*bike*. This asymmetric relation refers to the real world context in which a house is more permanent than a bike. The sentence in (2b) seems odd at first, since the reversed reference assignments do not mirror a common relation of the real world, but semantically, it is an adequate structure. A speaker dependent focus might profile the bike as the background information concerning the contextual situation (imagine a speaker standing at his/her bike pointing to the house). These examples indicate a functional difference as encoded by the figure and ground of a scene, and these asymmetrical differences have a profound impact in the encoding of spatial relations. For purposes of the current study, the semantic features of location and motion of the figure are primarily singled out, but also the semantic event features of the source and a causer (Fillmore 1968; Frawley 1992; Talmy 2000; Rice 2002a). These additional features imply that the spatial topological relations are not static only in Dene and that space is not simply embedded in an idealized, i.e., not usage-based, coordinate system.

In this section, a brief discussion of the theoretical background has been outlined to provide necessary information for the data description in section four. The next step is to describe the elicitation tool used to elucidate the encoding of space in Dene.

3. THE ELICITATION TEST

I use Pederson's et al. (1998) *Topological Relations Picture Series* for the elicitation and analysis of spatial topological relations in Dene. In particular, the grammatical or lexical marking speakers assign to static figures and grounds in the 71 line drawings is outlined. Based on the theoretical preamble in section two, the purpose of this study is (a) to identify how this language encodes the system of spatial relations, i.e., basically to determine the different cohorts, (b) to determine what the semantics of these markers are, and (c) to present evidence that space is not the only coordinate system in encoding spatial topological relations.

3.1 *The Description of the Topological Relations Picture Series*

The elicitation tool is embedded in the larger research framework of the 'Language and Cognition Group' of the Max Planck Institute for Psycholinguistics, Nijmegen, the 'Space group' in particular. Diverse research projects shed light on the interdependence of cognition and linguistics in collecting language data cross-linguistically. In particular, the overall aim of the instrument is to

(a) to identify a language's total resources for encoding static topological relations (positional verbs, spatial adverbs, case markers, adpositions)
(b) to delimit the pragmatics of use of such resources, and finally
(c) to discover the semantics of spatial terms (Pederson et al. 1998: 1).

The *Picture Book* is one possibility to elicit different spatial relation markers. It has been developed as an elicitation tool to enable the comparison of the grammatical marking of topological relations in a wide array of languages and it is intended as an open-ended exploration of how different languages use their linguistic resources to carve up the domain of topological space. The drawings are stimuli to evoke discussion on how the depicted relationships between objects are linguistically represented.

Several possible topological configurations of two objects can be singled out: proximity, contact, support, adhesion and partial/total inclusion between the figure and the ground. The various objects differ in number, shape, animacy, orientation, material and function (Pederson et al. 1998: 2). The secondary object differentiates in terms of its number and in its feature characteristics as being solid, a container, a body part, and a vertical or horizontal surface (Herskovits 1986; Vandeloise 1991). Using Talmy's figure-ground notion, the picture series represents different relations as already specified, e.g., contact, support or containment (Talmy 1978, 1983, 2000). Figure and ground are both defined as discrete objects for the various scenes. Pederson et al. state that the pictures represent culturally specific senses. This is indeed true for most of the drawings, since they represent very Western and idealized concepts not used in the language under research.

Unlike previous analyses of the encoding of static topological relations in non-European languages relying on translation equivalents to Indo-European languages, this test enables the researcher to elicit how different languages encode and carve up space. There is seldom an exact mapping between the extensional ranges of supposed translational equivalents across languages. Indeed, spatial expressions are notoriously difficult as we know for example from second language acquisition of spatial prepositions. The instrument is a method to provide a coherent extensional exploration of spatial language while minimizing the problems accompanied with translation and intuition.

3.2 METHODOLOGY

The researcher is inclined to ask the participant in the following way: "I am very interested in how to speak in your language about where one thing is in relation to another." The participant is told that s/he will see

some pictures and is then asked to describe where object X in the picture (marked by an arrow or color) is in relation to the other object(s) in the picture, e.g., a cup and a table, a boy hiding behind a chair or a boat on water. As suggested by Pederson et al., it can often turn out that spatial descriptions are a good place to locate some grammatical distinctions that are not strictly spatial in nature. This is indeed the case in Dene and, as it turns out in the test, the proposed "Where"-question by Pederson et al. implies or even forces a spatial topological relation which is not necessarily a natural pattern for a Dene speaker.

3.2.1 *Subjects, Equipment and Material*

A minimum of three speakers are required to get a valid range of utterances that indicate the language's resources to carve up space. For comparative purposes, about ten speakers are necessary. The test is designed as an offline task using the *Picture Book*. In addition to the print version, I have used a Power Point presentation on a laptop throughout the sessions. The results of these field sessions are transcribed by hand by a native speaker and by the researcher on a score sheet as developed by Pederson et al. In addition to the pencil and sheet notes, the sessions are digitally recorded via a portable mini-disc player. For the purpose of a summary and overview, the data is transferred from the score sheets to an electronic version to provide a data file. The results are confirmed by the native speaker and by using the electronic Dene-to-English dictionary of the Department of Linguistics, University of Alberta (Dr. Sally Rice; see also Cook 2004; Elford 1998; Li 1948).

Native speakers of Dene Sųłiné, solicited primarily from the Cold Lake First Nations Reserve, serve as paid language consultants for this project. The native and near-native speakers of this language were interviewed (all of whom are bilingual English-Dene) at their convenience in Edmonton or in Cold Lake, Alberta. A total of 14 speakers were interviewed, 9 female, 3 male, age ~ 35-85.

3.3 *Results*

The results of the initial elicitation tool indicate that language specific affordances take over in the cognitive semantic domain for the encoding of topological spatial relations. Those are expressed by a rich locative plus classificatory verb cohort system including additional directional prefixes. The verb stem itself in addition to the range of prefixes profile the figure's degree of specificity, the perspective in the viewing arrangement, and particular meaning components that encode aspectual, modal, tense, and number information. These cohorts present a very stable pattern throughout the data.

The single locative morpheme like a preposition in English does not provide sufficient semantic information on the figure-ground asymmetry, but encodes only the primary or very generic spatial relation. Moreover, it turns out that space is not the only parameter in encoding spatial topological relations. Again, I did expect to find the semantic load of a spatial relation in adpositions, but, as Dene nicely indicates, we do need to consider the cohorts that only as a whole express spatiality and/or temporality (Croft 2001). Furthermore, we see a detailed degree of specificity and a compelling lexicalization process due to the language affordances. This implies that, as opposed to, e.g., English, Dene expresses every semantic aspect of the involved participants on a highly fine-grained scale of overt encodings or degree of specificity.

Indo-European languages tend to code spatial topological relations by using spatial morphemes (as seen in a pilot study with English and German speakers). One of the most striking findings is that descriptions of the relations between static figures and grounds are not similarly coded in Dene by a simple postpositional spatial morpheme. Spatial encoding is only used to provide a more dynamic and perspectivized—speaker deictic—construal, as opposed to a rather static and objectivized one. Table (1) presents the frequency of the various cohorts.

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Table (1): DENE FREQUENCY ACCOUNT

	CONSTRUCTION	∑	%	RELATION
1	F-CLV	204	21.5	DYNAMIC
2	G-LOC-F	180	19.0	DYNAMIC
3	F-G-LOC-CLV	168	17.7	DYNAMIC
4	F-G-CLV	120	12.6	DYNAMIC
5	G-F-CLV	108	11.4	DYNAMIC
6	F-LOC-G-CLV	60	6.4	DYNAMIC
∑		840	88.6	
7	F-G-CLV	24	2.5	STATIC
8	G-LOC-CLV	24	2.5	STATIC
9	G-LOC-F	24	2.5	STATIC
10	F-CLV-G	12	1.3	STATIC
11	F-LOC-CLV	12	1.3	STATIC
12	F-CLV -G	12	1.3	STATIC
∑		108	11.4	
∑		948	100	

The frequency account indicates that most usages are indeed dynamic and by that not predominantly static, i.e., topological. Moreover, we see that the most frequent cohort does not use any adposition to express a topological relation, but only a figure-classificatory verb cohort. Examples for these cohorts are a boat (sail) floating on water, cloud floating in the air or an arrow that pierces through an apple respectively. Here we see that the motion or causation of the figure is profiled rather than a purely spatial and static relation (see examples below). This result implies that topological relations are not that basic, and if they are, they are by no means speaker-neutral and objective features of the objects to be encoded. This result confirms Slobin's argument for subjective orientation that

> [...] we can only talk and understand one another in terms of a particular language. The language of languages we learn in childhood is a subjective orientation to the world of human experience, and this orientation affects the ways in which we think while we are speaking. (Slobin 1996: 91)

Moreover, speakers frequently reverse the figure and ground elements, and therefore it can be claimed that the natural background does not serve as an objective and given reference point. In addition, they also frequently leave out any explicit mentioning of the ground.

The drawings are described by the function of the figure being located by its texture, material, size, and shape in relation to the ground. Therefore, the drawings are not only described in terms of any inherent—speaker-independent—semantic information given without context or perspective, but as contextualized situations. Contextualized here means simply the inference of extra-linguistic knowledge. For example, presenting the scene of a boat on water or a cloud above a mountain is basically described as objects moving or floating caused by the wind. It is not a spatial topological relation expressed by a locative only, but the profile of the causation of the motion, i.e., a temporal and dynamic event. Due to language-specific affordances, speakers impose extra-linguistic context to the drawings as expressed by the degree of specificity. This degree implies that the language needs to encode all participants overtly as opposed to, e.g., English that infer a lot of information of extra-linguistic knowledge not semantically encoded. As seen in a

pilot study with English or German speakers, it turned out that speakers did not need to specify that, e.g., a bottle is standing in an upright position in relation to the horizontal ground. However, this is only partially true since German uses a rich posture verb inventory that does indeed specify a vertical orientation towards the reference point or at least implies a specific orientation or perspective.

These observations lead to the initial assumption that Dene presents specific affordances necessary in the encoding of various figures. Most spatial analyses so far have been premature even for most Indo-European languages in terms of the semantic information that is expressed. The semantic load is not only encoded by a locative or adposition, but is expressed by the locative in a spatial verbal predication.

As mentioned above, the semantic cohorts encode and link systematic relationships between a classificatory verb, directional prefixes, and a locative in the figure-ground asymmetry. The same locative gives the basic spatial information on the figure-ground relation. The main attribute is given in connection to the verb stem plus classifier cohort, i.e., the verb theme plus its prefixes as indicated in the template below (table 2). It provides the core orientation of the figure.

The question remains what kind of coordinates encode the semantic information of spatial topological relations in Dene. If it is not space on its own, then what are the parameters, and what is the underlying cognitive pattern in encoding figure-ground relations? To present a more satisfying answer, I want to give a detailed description of selected examples of Dene.

4. SPATIAL TOPOLOGICAL RELATIONS IN DENE Sųłiné

This section presents a selective cognitive semantic description of principally topological spatial relations using Talmy's taxonomy of different construction types as summarized in section (2) above. Basically, the predominant role of the non-linguistic influence in spatial cognition—perceptual and kinesthetic domain—regarding spatial words is at issue here and the orientation of the figure being located in relation to the reference object.

The glosses are structured as follows: Line (1) (a) presents the name of the objects and their proposed relation and the picture itself including the number of the grouping used in drawings, and the page number in the *Picture Book* , (2) presents the construction type and imaging concepts, (3) the Dene data, (4) an English approximate translation. Moreover, in some cases I have added several related verb paradigms and sometimes approximate descriptions of selected morphemes the cohort consists of, given in a footnote or directly following the example. In addition, I parsed the morphemes of the cohorts following directly the example (as indicated by «...») to present the arbitrary boundaries between the morphemes. In the appendix I have given an overview of the most frequent verb stems and their different meanings. The semantic distinction of the classificatory stems follows the taxonomy as proposed by Davidson, Elford & Hoijer (1963: 31ff.). Furthermore, I have divided this section into several functional, topological and projective notions and relations.

The general encoding pattern in Dene indicates that the language features a predominant and consistent classificatory verb system including adverbial and directional prefixes as well as a postpositional inventory creating a relational predication cohort (Li 1946; McDonough 2000; Rice 2002b on the general structure of the Athapaskan verb stem system). These stems change in terms of shape, animacy, and/or physical features of the object being located or handled (Rice 2002b: 69). The general focus here is on the motivation of certain semantic construction types and the encoding of the figure-ground asymmetry as modified by the cohort.

> 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 (Carter 1976: 24; see also Rice 1997: 103ff.).

These stems profile existential situations or actions of certain categories of objects (Davidson et al. 1963). The next sections present these different qualities and how they profile the figure in particular. Before presenting the data, a brief overview of the Dene verb structure is given.

4.1 *Dene Verb Structure*

The Dene verb shows polysynthetic and fusional characteristics in its morphology and has a rich prefix system. The usual word order is SOV, but the Dene verb word has also propositional character, i.e., subject and object prefixes are fused within the verb (Rice 2002b: 66ff.). A general idealized schema of the Dene verb plus stem pattern is given in table (2).

Table 2: An Idealized Templatic Rendering of the Dene Verb Prefixes + Stem

PP	ADV	ITER	INCORP	PRON 3SUBJ	OBJ	MODE	ASPECT	1ST/2ND SUBJ	CLASS	STEM
1	2	3	4	5	6	7	8	9	10	

(Li 1946; McDonough 2000; Rice 2002b)

McDonough divides up the verbal complex into a bipartite structure, i.e., positions 1-4 are the satellites, and positions 5-10 are defined as the stem position (McDonough 2000; K. Rice 2000). The following list summarizes the single positions in more detail.

Table 3: Prefix Slots

1. incorporated postposition
2. local and adverbial prefixes
3. iterative prefix (distributive)
4. incorporated noun stems
5. 3rd person pronominal subjects

6. pronominal objects
7. modal prefixes
8. aspectual prefixes
9. 1st/2nd person pronominal subjects
10. (valency) classifiers
11. stem

Following common descriptions in the Athapaskan literature, the positions 1-4 are called disjunctive prefixes, and positions 5-6 pronominal subject. They are part of the disjunct or lexical zone and have derivational function. The positions 7-10 are called conjunct or grammatical zone and have obligatory inflectional categories such as tense, aspect, modality, subject agreement, valency (Li 1946: 409). Concerning the following analysis of the elicited cohorts, the stem plus the positions 10-8, and 1 are of primary importance. Unfortunately, the rendering in table (2) and (3) must be understood as an idealized template since it is mostly due to the linguist's abstract theoretical and wishful thinking that we do find such clear-cut boundaries. Such boundaries are imposed by the influence of Indo-European language analyses that do indeed seem to have a clear-cut morphosyntax. I am arguing here that Dene provides the semantic information not aligned with lexical units or parts of speech, but in a more scattered fashion in which we see semantic cohorts distributed throughout the phrase. This assumption is in line with Li's very insightful description of Dene. He claims that the Dene verb "is a complicated structure, consisting of a stem and a number of prefixes" (Li 1946: 404). Furthermore he states that it is not possible to parse verbs into, e.g., prefix and stem to determine the meaning. For example, the verb *to dream* is composed of the prefix *ná-* and the stem *-te*. The former means something like *here and there*, *about* and the latter *a living being lies around*. Li argues that parsing *náste* 'I dream' into its components does not lead to the English understanding of dreaming from the morpheme's meanings. Hence, it has to be concluded that the presented template is nothing more than an idealized form of the verb structure's meaning. Indeed, the conception of cohorts used in this paper does much more justice to the

semantic complexity of Dene than a fine-grained and abstracted description of the language. However, I have added a morpheme-to-morpheme parsing following the English gloss. This is to indicate the complexity and semantic richness of the various cohorts and to present the semantic ambiguity of several morphemes in the various environments they occur in.

4.2 *Topological Cases*

This section provides topological cases as consistent with many Germanic languages. The locative, directional prefix plus classificatory verb cohort encodes a certain speaker-(in)dependent perceptual perspective, and also a kinesthetic orientation in a 'spatial vector matrix', as I will call it. The cohort profiles a general continuum of agency and control for the specific cognitive domain.

4.2.1 *Inanimate Figures Supported by Planar/Horizontal Ground*

The data in this section indicate the predominant encoding of the spatial relation by the postposition *k'e* 'on' plus a locative—posture/poster—verb including an orientational/spatial prefix. In particular, spatial topological relations like containment, contiguity, support, occlusion, proximity and projection are encoded. The posture verb does not encode movement, and the orientation of the object is at rest (Davidson et al. 1963; Rice 1997: 103). The semantics indicated by the object "being at rest" implies that these verbs are posture verbs such as *sit*, *stand*, and *lie* (Rice 2002b). The focus is primarily on the general location of the figure as encoded by the postposition in addition to the verb system.

       The data in (3a-c) through present the relation of contiguity and support in which the ground supports the figure from below.[2] The classificatory verb is a posture or locative verb (POST) expressing that the figure is not in motion and that the orientation of the figure is at rest (Davidson et al. 1963: 31; Rice 1997: 103)

(3)   a.   Pencil on desk. (A1/59)

FIGURE	GROUND	LOC	POST[FIG]
erihtɬ'íschené	hąlzuzi	k'e	datheţą «da-the-ţą»
pencil	office.desk	on	up.3SG.S.IMPF.SO.situated

'The pencil is (up) on the desk'.

    b.   Cup on table (A2/1)

FIGURE	LOC	GROUND	POST[FIG]
tsobįlí	k'e	bek'eshich'élyį	datheţą
cup	on	table	up.3SG.S.IMPF.SO.situated

'The cup is (up) on the table.'

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[2] SO stands for a single "rigid sticklike object", e.g., *pen*, *scissor*, *table*, *chair*, *key*, *canoe*, *car* (Davidson et al. 1963: 34), RO for "round or hard/compact objects", e.g., *ball*, *radio*, *coin*, *pen-knife*, *one berry*, *one shoe*, *ring*, and FO for "flat or flexible objects" or handle a fabric, e.g., *blanket*, *article of clothing*, *a leaf*, *a pillow*, *a dollar bil*l (Rice 1997:106).

     c.   Tablecloth on Table (A4/29)

FIGURE	GROUND		POST[FIG]
dosǫ	bek'eshich'élyį̱		nárį̱́chúdhi «ná-rį́-ɬ-chúdhi»
cloth	table		in.place.of.3SG.S.IMPF.FO.situated

'The cloth is placed over the table (draped over).'[3]

In (3a-b) the locative classificatory verb stem **-tǫ** of a stick-like object encodes a general and neutral position of the figure. The prefix **da-** encodes the degree of specificity pointing to a certain elevated position, and the thematic prefix **-the-** expresses the imperfective process of the event. Moreover, the prefix **da-** profiles the general location of the inanimate Figure in addition to the horizontal contact and attachment location as indicated by the postposition **k'e.** In both cases the figure—the smaller entity—is supported from below by the larger background. The general orientation of the figure and its topological relation is inferred by the locative **k´e**. The salient reference point is the same larger background as expected in English, i.e., *the table* or *the shelf*. The moveable objects are consistent with English *the pencil* respectively *the cup*.

       Example (3c) exemplifies the amalgam of the location being expressed by the cohort. The flexible object is not only on the table, but the table is covered by the cloth, i.e., the cloth is draped over the table. In (3a-b) the postposition is a locative marker of the place and topological space of the figure to be located, in (3c) no postposition marker is encoded.

       A plural object is placed in examples (4a-b) and in which we see the figure being located on the ground in a static position.

(4)   a.   Hose on Stump (coiled) (A7/23)

FIGURE	MANNER	LOC	GROUND	POST[FIG]
tɬ'ule	dethe	k'e	echįchené	dathela
rope	twisted	on	stump/tree/wood	up.3SG.S.IMPF.PO.lay(handle several objects)

'The rope lays twisted on the stump.'

     b.   Hose on Stump (draped over) (A8/43)

FIGURE	GROUND	LOC	POST[FIG]
tɬ'ule	echįchené	k'e	daxárela «da-xá-re-la»
rope	tree/wood	on	up.3SG.S.IMPF.PO.lay(strung over, some part on/off)[4]

'The rope lays on the stump.'

All examples in this set present static locations between the figure and the ground. The ground is a horizontal surface and all figures are non-animate objects, e.g., *pencil*, *rope* or *cup*. Different stems encode various figures depending on its shape or texture and the postposition serves as the general locational marker for the figure in relation to the ground in addition to the classificatory verb.

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[3] *ná-*(iterative) = 'in place of'.

[4] *da-* = 'up'; *xá-* = 'out', 'to', 'for'; *-re-* = pronominal prefix; 'place around', 'along'; *-la* = 'lay'.

4.2.2 *Inanimate Figures Coincident and Attached with Ground-Relation*

The following set (5) and indicates a general orientation and an extended vertical—upright—location of the figure as being located in relation to the ground.

(5) a. Tree on top of mountain. (A9/65)

GROUND	FIGURE	POST[FIG]	
shéthlaé	el	naghį?a «na-ghį-?a»	«naghigha»
hill.on.top.of	spruce.tree	up.3SG.S.IMPF.SO.stand(to have extension)	

'The tree stands on top of the mountain (standing upright)'.[5]

  b. Tree on side of mountain (A10/17)

GROUND	LOC	FIGURE	POST[FIG]	
shéth	k'e	el	naghį?a	«naghigha»
hill	on	tree	up.3SG.S.IMPF.SO.stand(to have extension)	

'The tree is located on the mountain (standing upright).'

  c.

GROUND	LOC	FIGURE	POST[FIG]
shéth	k'e	el	neshą «ne-s-hą»
hill	on	spruce.tree	3SG.S.PERF.SO.grow.out

'The tree grew on the mountain.'[6]

  d.

GROUND+LOC	FIGURE	POST[FIG]
hotaghe	el?aze	naghį?a
on.the.side.of.hill	small.spruce.tree	up.3SG.S.IMPF.SO.stand(to have extension)

'The tree is on the side of the mountain (standing upright).'

In all cases, a physical contact between figure and ground is expressed. Example (5a) encodes the location by a locative static verb encoding the figure's general location towards the ground as being in an attached and upright position with respect to the secondary object. In addition, the ground specifies the location as being attached to the horizontal ground and supported by it, e.g., *X on top of Y*. In (b) the orientation of the figure is encoded through the cohort (locative plus verb system) and the primary information is to express the support by a horizontal surface. The act of growing out is profiled with the locative in (c), hence the spatial relation has a rather secondary function and no projection is indicated by the spatial morpheme *k'e*. As opposed to this construction type, example (d) conflates the ground and locative by the secondary object. The figure is conflated in the verb stem encoding an earth-based orientation of the figure, and no postposition profiles the general orientation.

The following category indicates how the inanimate figure relates to the ground in terms of an attached relation. Topological relations like contiguity and supporting are encoded. All situations are point-to-point attachments (Bowerman & Choi 2001).[7]

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[5] *na-* = adverbial prefix; continuative (iterative) form, 'in place of'; *-ghį-* = perfective form?

[6] *ne-* = momentaneous (zero class, intransitive, transitive, poster); *ne-* = adjectival, as in *nenédh* = 'it is long'.

[7] Following Davidson et al. I will indicate verbs referring to free movement not involving an agent with the abbreviation VFM (verbs of free movement).

(6)　　a.　　Leaves on twig (B7/41)

FIGURE	LOC	GROUND	VFM[FIG]
t'ą́chai	k'e	dechen	haįshą «ha-į-s-hą»
leaves	on	tree	3PL.S.PERF.FO.grow.out.of

　　　　　　　'The leaves grew out of the tree.'[8]

　　b.

FIGURE	VFM[FIG]
t'ą́chaiʔaz	danįshą «da-nį-s-hą»
little.leaves	3PL.S.PERF.FO.grow.out.of

　　　　　　　'The leaves grew.'

　　c.　　Apple on twig (B8/27)

FIGURE	LOC	GROUND	POST[FIG]
jie	k'e	jiechene	theʔą «the-ʔą»
fruit	on	fruit.tree	3SG.S.IMPF.RO.lie(handle round solid object)

　　　　　　　'The fruit is on the fruit tree.'

　　d.

FIGURE	POST[FIG]
jiechok	datheʔą «da-the-ʔą»
fruit.big	up.3SG.S.IMPF.RO.lie(handle round solid object)

　　　　　　　'The big fruit is situated up.'[9]

　　e.

FIGURE	VFM[FIG]
jiechok	daneshą «da-ne-s-hą»
fruit.big	up.3SG.S.PERF.RO.grow

　　　　　　　'The big fruit grew.'

In (6a, b, c) the inanimate figure is profiled by a locative marker determining the figure as being situated in an attached relation to the ground via the morpheme *k'e*. This morpheme correlates with the posture verb determining and conflating the figure and the general location of the figure. We do detect two distinct meanings. The former is a temporal marker to indicate the temporal event of the figure's motion. The latter is a locational marker to express the placement of the figure in relation to the ground. In (6a, b, e) we see the encoding of the figure as a growing-out process rather than a purely locational relation. The salient feature is not only the location of the figure in an attached point-to-point relation to the ground as expressed by the supported-by-hanging relation in, but the motion or dynamicity event of the figure. A certain motion is implied including path of the figure as indicated by the growing down/upright tracjectory in a vertical direction away from the ground. As opposed to (6a, c) no postpositional marker is used to express either a location or temporality. It is not sufficient to express a static (+) contact and (+) attached/contiguity relation of the figure only. A more dynamic perspective is taken to support the idea of the figure's potential motion as implied by the *growing out of* movement. This difference indicates a different cognitive semantic pattern to encode the figure-ground relation in terms of a dynamic function of the figure and not simply a static location in encoding the asymmetry.

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[8] *ha-* = (ablative); *move out off.*
[9] *da-* = allative marker?

4.2.3 *(Non)Topological Relations of Inanimate Figures*

The former sections indicated the static topological relations between the primary and secondary object in rather static scenes. However, the examples in (6) did already present the general saliency of a temporal motion event as opposed to a pure static and topological one. The following examples provide further evidence for the prominence of a dynamic relation or event structure as opposed to a purely static relation. The section's title is misleading in so far as the following examples are indeed topological in the first place, but reveal a predominantly dynamic and temporal pattern as well.[10]

(7)   a.   Raindrops on window (D1/48)

GROUND	LOC	FIGURE	VFM[FIG]
yak'e	k'e	chą	nadadetth'i «na-da-de-tth'i»
window	on	rain	up.3SG.S.IMPF.AM.drip

'The rain drips on the window.'

Related paradigms:

dá–re–tth'er	'they are dripping'
–tsel	'to wet, soak'
–zel	'splash water'
–tth'er	'water is dropping, drips down'
–tthigh	'water goes down by dropping'

    b.

GROUND	LOC	FIGURE	VFM[FIG]
yak'e	k'e	chą	dárelez «dá–re–lez»
window	on	rain	3PL.S.IMPF.AM.drip/raining

'The rain drips on the window.'

    c.

GROUND	LOC	FIGURE	VFM[FIG]
yak'e	nuzį	chą	dádelez «dá–de–lez»
window	to.see.through.it	rain	3PL.S.IMPF.AM.drip/raining

'While seeing through the window the rain is pouring down/pass on the window.'

Related paradigms:

de–s–lez	'I am dripping'
de–l–ez	'He is dripping'
dá–rí–l–ez	'We (pl.) are dripping'
dá–re–l–ez	'They (pl.) are dripping'
de–he–l–ez	'They(dl.) are dripping'
chą de–l–ez	'It is raining hard'
–de–	adjectival, modal prefix?
chą ná–re–lez	'It is raining lightly.'

The examples in (7a-b) encode a general spatial orientation of a wet substance as being located on the surface Since the figure—*water*/*rain*—is by definition not static, it is encoded as an event of free motion. The direct static attachment to the ground as proposed by the drawing as in *the raindrops are on the window* is not sufficient for the cognitive semantic domain expressing liquid on a surface. At first glance, the postposition *on* would fulfill this function, but I want to claim again that it is used here rather as a temporal marker than a

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[10] The abbreviation AM stands for the object as being an "amorphous mass with the texture of hay, grain, snow […]" (Davidson et al. 1963: 34).

locative marker. During the elicitation session speakers were specifically asked to describe the relation between the rain and the window in this example. Even an implied and imposed topological relation indicated by the question 'where is the rain' did not evoke a pure topological, static on-relation. Again, in (7b-c), the event of raining is emphasized. Since the event is at focus of the speaker, we do see that not the static relation of the figure being attached to the ground is profiled.

A similar example is given in (8) in which the substance of the figure determines its relation to the ground, leading to a reverse relation of the asymmetry.[11]

(8)   a.   Butter on knife (D2/12)

GROUND	LOC	FIGURE	CLV[FIG]
bes	k'e	tɬes	thetɬe «the-tɬe»
knife	on	greasy.substance	3SG.S.IMPF.MM.situated

'The butter is on the knife.'

Related paradigms:
-tɬegh   *mud-like object lies*
-tɬagh   *to grease*

      b.

FIGURE	GROUND	LOC	POST[FIG]
bes	tɬes	yaghe	heʔą̨ «he-ʔą̨»
knife	greasy.substance	under	3SG.S.IMPF.RO.lie(handle round solid object)

'The knife is covered by the butter (= knife under butter).'[12]

      c.

FIGURE	GROUND	LOC	CLV[FIG]
beschok	tɬes	yaghe	heɬtth'er «he-ɬ-tth'er»
sword/knife	greasy.substance	under	3SG.S.IMPF.RO.fall(into)

'The knife falls into the butter' (= knife is covered by the butter).'

Related paradigms:
ná–he–s–tth'er   'fall'
ná–hé–keth   'SO fell'
yu–ɬ–k'éth   'he keeps on shooting.'
-tth'igh, -tth'er   'to fall'
he-   inceptive
-ɬ-   classifier (transitive, causative)

Example (8a) gives a consistent topological relation as expected by the proposed scene of the picture for English or German speakers, i.e., a wet or smeary substance is located *on* a solid surface as profiled by the postposition. The figure is supported by the horizontal ground in a static relation. As opposed to this topological relation, we see in (8b-c) that the figure is not only supported by the ground, but in fact, the locative *yaghe* plus the verb stem *-tther* implies that the figure is inseparably related to the ground (occlusion). The substance of the figure matters in this occlusion relation. It is a 'containment-by-encircling-ground' relation, to use Pederson's et al.'s expression (1998). The verb of handling as expressed by greasing it in provides a dynamic usage event and the particular manner. This is opposed to the static spatial relation in (8a) profiling only the product of the location as being static. In (8b-c), the figure-ground asymmetry is reversed and the substance—*butter*—is now the prominent reference point in the speaker's perspective as opposed to the larger and hence prototypical background.

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[11] MM stands for a "mass of mushy matters", e.g., *lard*, *butter* or *honey* (Davidson 1963: 34).

[12] *he-* = (3PL./DL.) modal prefix; inceptive (requires momentaneous stem)

The next set encodes a static spatial relation in the first place, but the latter example supports a rather dynamic event.[13]

(9) a. Ring on finger (I3/10)

GROUND	LOC	FIGURE	POST[FIG]
belatth'ele	k'e	laʔanį'	datheʔą «da-the-ʔą»
POSS(his/her).on.finger	on	ring	up.3SG.S.IMPF.RO.lie(handle round solid object; causative)

'The ring is on his/her finger.'

b.

GROUND	LOC	POST[FIG]
laʔanįdenela	k'e	thetą «the-tą»
ring.person's.hand	on	3SG.S.IMPF.SO.situated(lie?)(handle stick-like object)

'The ring is on the person's hand.'

The former set presents the figure being supported by the ground in an encirclement relation. The locative posture verb encodes an attached relation between the figure and the ground. The latter example indicates that the locative *k´e* needs additional semantic information. The positional verb stem *-tą* only specifies the general location of the figure.

This section presented several cohorts encoding spatial relations like flexible or round objects and the inanimate figure being supported by the ground in most cases. The contextualization of certain figure-ground asymmetries has proven as to be dynamic, e.g., *butter on knife* or *rain on window*. In all examples, the cohort conflates the figure and the general location of the figure. The postposition, if used at all, bears temporal implications in addition to its locative function.

4.2.4 *Ground Encircled by the Figure Relations*

The following data show the relation of the figure as being *around* the ground. A general attachment/contact relation is given in the following examples.[14]

(10) a. Ribbon around candle (I2/4)

GROUND	LOC	FIGURE	VMC[FIG]
bek'ák'ánaz	nare	sųnibán	hetɬ'ó «he-tɬ'ó»
candle	around	ribbon	3SG.S.IMPF.FO.tied.to/decorating.it

'The ribbon is tied to the candle.'

b.

GROUND	FIGURE	VMC[FIG]
tɬ'esbek'ák'áni	sųnibán	héhchedh «hé-h-chedh»
candle	ribbon	3SG.S.IMPF.FO.tied.to.sth.

'The ribbon is tied to the candle.'

Related paradigms:
hé-thi-ɬ-chedh   'I tied it to sth.'
k'ó-chedhé   'necklace tied'

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[13] The designated object conflated in the stem is a "single round hard object" abbreviated as RO (Davidson 1963: 34).

[14] FO indicates a fabric-like object, and verbs that express handling or manipulation and continuing manual contact are abbreviated with VMC).

In both examples the figure is simply related to the ground in an attached or contact relation as being tied in an encirclement relation. Likewise, the next set provides an encirclement expression.[15]

(11)   Necklace around neck (I6/51)

FIGURE	LOC	FIGURE	VMC[FIG]
bek'odh	k'e	iɬts'ézi	nárélya « ná-ré-l-ya» « názélyai»
his/her.necklace	on	beads	3SG.S.IMPF.AO.wear(dress, coat)

'He/she wears a necklace' (worn by the his/her neck).'[16]

In (11) the figure is attached to the ground in direct contact as encoded by the locative *k´e*. The process of an animate subject wearing X around Y is profiled, and the location is only We hadaryseen the influence of the substance of the figure and, in addition, the influence of extra-linguistic knowledge. The data indicate the prominent reference point being contextualized and perspectivized. It has also been indicated here that Dene speakers use a detailed lexicalized semantic cohort system expressing a high degree of specificity to express overtly all participants in the proposition. Most semantic information that is inferred in English or German, e.g., has to be transparently lexicalized in Dene and cannot be left out. I will provide further examples in the following sections that present this qualitative specificity of Dene.

4.3 *Inanimate Figure Interior to Ground Relations: Complete Containment*

The following examples present several construction types of spatial relations indicating the figure as located interior to or contained by the ground. Example (12) is a situation type of full inclusion of the figure being interior to the ground.

(12)   a.   Apple in bowl (L4/2)

GROUND	LOC	FIGURE	POST[FIG]
jiéchok	ye	tth'aí	theʔą «the-ʔą»
fruit.big	in	dish	3SG.S.IMPF.RO.lie(situated?)(handle round solid object)

'The big fruit is in the bowl.'

b.

FIGURE	GROUND		LOC	POST[FIG]
jiéchok	ts'ątsánétth'ái	tsóghaze	ye	theʔą
fruit.big	metal.dish.bowlike.shape/vessel		in	3SG.S.IMPF.RO.lie(handle round solid object)

'The big fruit is in the metal bowl.'

The figure in (12a-b) is located inside the container, and the figure is in a complete containment relation. The postposition is a locative marker and hence we see a static topological relation between the figure and the ground.

As opposed to the static relation in (13), the next two sets encode the figure as located basically as a motion event, i.e., poked through the ground, and include different construction types. Different salient reference points are profiled that supports the dynamicity of the scene.[17]

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[15] AO stands for a single animate being; Davidson et al. 1963: 34.

[16] *-re-* = 'place around'; *ná-* = 'in place of'

[17] Verbs that express partially controlled action that is initiated by an agent are abbreviated with VCA).

(13) a. Spike in/through papers (Q1/22)

GROUND		LOC	FIGURE	VMC[FIG+LOC+MOTION]
hots'áɬ»hotséɬchogh«		k'e	eritɬ'is	dathegé « da–the–gé»
spike/nail		on	writing	up.3SG.S.IMPF.SO.poke.through

'The papers are poked through by the spike.'

b.

FIGURE	VCA[FIG+LOC+MOTION]
eritɬ'is	begharahgei «be–gha–rah–gei»
writing	3SG.S.IMPF.SO.sharp.thing.through

'The spike sticks through the papers.'[18]

Example (13a) encodes the figure by the locative cohort profiling a skewering relation in the figure-ground asymmetry. The stem indicates not only the figure, but also its location and motion as indicated by the English translation using the preposition *through*. The postposition encodes a general orientation of the figure, but I will argue that it rather encodes the imperfective temporality of the referent it takes. This assumption is motivated by the usage of the cohort that profiles the static function, i.e., *to poke through* is the profiled relation rather than a topological relation only. This is more strikingly the case in (13b) in which the ground, location and the motion of the figure are conflated by the verb. Moreover no postposition is used as a general locative marker. In summary, both examples profile the motion of the figure as being pierced through the ground. This becomes more consistent in the next set in which a certain dynamic event is expressed.

(14) a. Arrow in/through apple (Q2/30)

FIGURE	GROUND	VCA[FIG/LOC/MOTION]
k'á	jie	ghąnįgé «ghą–nį–gé»
arrow	fruit	3SG.S.PERF.SO.poke/spear.through(by sharp object?)

'The fruit is poked by a sharp object.'[19]

b.

GROUND	VCA[FIG/LOC/MOTION]
jiechok	hehch'ą «he–h–ch'ą»
fruit.big	3SG.S.IMPF.SO.motion[of arrow against/away]

'The arrow's motion is through the apple.'[20]

c.

FIGURE	GROUND	VCA[FIG/MOTION]
k'a	jiechok	ghąhęltás «ghą–hę–l–tás»
arrow	fruit.big	3SG.S.IMPF.SO.shoot(?)(horizontal.motion)

'The arrow shoot through the apple.'[21]

Here we do not have a general orientation being encoded, but a manipulation of the ground, i.e., a verb of handling. The figure in (14a) is conflated within the verb phrase as a construction type and we see a dynamic encoding pattern implied by the verb *to pierce*. In (14b-c) the figure is also dynamic in terms of its motion through the ground. Hence, the arrow is not simply located inside the apple or in a skewering relation, but the idea of movement and direction is encoded in adding the change of position of the figure in using a directional location verb. This latter example indicates the necessity to encode the figure as the primary

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[18] *hú–nį–ge ha* = 'You will poke him'

[19] *ghą–* = 'at', 'about'.

[20] *he–* = peg element or inceptive (3DL.S); *hehe–* = dual subject forms?

[21] *hú–ne–s–tás* = 'I shoot (an arrow at it)'.

object in motion being not in a static position. The motion is indicated in the picture, since we see a hand that forces the arrow or stick through the apple.

4.3.1 *Inanimate Figures Superior to Ground-Relations*

In the following section, inanimate figure-ground relations and their spatial locations as indicated in English by the locative *over* or *above* are presented. Generally, the spatial relation expressed by the preposition *over* indicates that the location is "in the sphere of" the reference object (Talmy 1983: 248).

(15) a. Lamp over table (S2/13)

FIGURE	GROUND	LOC	POST[FIG]
bek'eshich'elyį	bek'ák'áni	yaghe	dathetą «da‑the‑tą»
table	lamp	under	up.3SG.S.IMPF.SO.situated

'The table is under the lamp.'

  b.

GROUND	LOC	FIGURE	POST[FIG]
bek'eshich'elyį	daghe	bek'ák'áni	nághebeɬ «ná‑ghe‑beɬ»
table	above/over	lamp	up.3SG.S.PERF.RO.hang.down.from.up

'The lamp hung down from above.'[22]

The expression in (15a) indicates that the primary object is encoded, which is actually the larger background in the picture. The focus here is the table as opposed to (15b). The speaker emphasizes the location of the primary object as *hanging down from above*. The data encode in both cases a static relation as opposed to example (16a-b) where the locative only expresses a secondary spatial relation. The focus is on the movement of the figure.

(16) a. Cloud over mountain (S1/36)

GROUND	LOC	FIGURE	POST[FIG]
ttheshéth	tedhe	yak'odh	huɬt'í «hu‑ɬ‑tí»
rock.hill	above/over	cloud	3SG.S.IMPF.AM.situated

'The cloud is located above the mountain.'[23]

  b.

GROUND	LOC	FIGURE	VFM[FIG]
ttheshéth	daghe	yak'odhaz	ghesheɬ «ghe‑s‑heɬ»
rock.hill	above/over	cloud	3SG.S.IMPF.FO.float(uncontrolled.manner?)

'The cloud (located above the mountain) floats (caused by the air).'[24]

In both cases a "partially controlled action" is encoded (Rice 1997: 103). In (16a) the figure is situated in a static location above the ground. In (16b) the theme expresses the wind causing the motion of the figure. The speakers clearly argue that the figure cannot be a non-moving static entity in a position above the ground, i.e., both objects are not vertically aligned—'in sphere of'. Instead, the encoding of this scene relies primarily on the description of the motion event as a dynamic situation as opposed to the static situation captured by the picture. The origin of the motion is specified in (16b), i.e., the source of the motion as being moved by the wind or air. The causer is profiled.. This example implies a specific movement being profiled because of the

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[22] *na‑* = 'in place of'; aspectual; iterative = again, customary ('move downward from up').

[23] *hu‑* = 3DL.S.?; optative prefix; 'pointing at', 'towards'.

[24] *ghe‑* = move horizontally; RO moved uncontrolled (perfective)?

causation. The postpositional expression *over* is again secondary and could be described as a temporal marker rather than a locative marker. In English, the temporal trajectory is profiled in an utterance like *the plane flew over the city* where a certain motion is profiled in addition to the spatial arrangement.

This section indicated how static relations are encoded as primarily dynamic motion events. We have seen that an idealization of the scene in locating the figure above the ground, for example, does not refer to the inherent or 'natural' motion feature of the figure. This information is relevant for the speakers and the static scene is therefore contextualized and encoded as a dynamic event and by that as a temporal process being atelic. Furthermore, many non-linguistic factors are expressed overtly, like the causation of a motion. We will see more striking examples in the last section in which the picture of a boot on water is encoded similar to the cloud above mountain, i.e., as a dynamic event.

4.3.2 *Inanimate Figures Inferior to Ground Relations*

In this section, the complementary relation of *over* as presented above is given. The first set presents the encoding of the figure in an inferior position to the ground.

(17)   Ball under chair (V1/16)

GROUND	LOC	FIGURE	POST[FIG]
edáchené	yaghe	dzóɬ	theʔą «the-ʔą»
chair	under	ball	3SG.S.IMPF.RO.lie(handle round solid object)

'The ball is under the chair.'

The figure is conflated in the verb stem *-ʔą* including the general orientation by the posture verb *lie*. The figure is located in relation to the salient reference point as being positioned inferior to it. The material of the figure does not matter as opposed to the examples above in which the smeary substance of the butter or the liquid substance of the cloud as an amorphous mass do indeed matter.

That substance can matter for inferior relations as well is presented in the next set. Additional information is encoded since the material of the figure—the elastic texture of the gum—implies a sticking-relation to the ground. The semantic information of being attached to is added because of the inherent texture feature of the figure.

(18)   a.   Chewing gum under table (V3/53)

GROUND	LOC	FIGURE	CLV[FIG]
bek'eshich'elyį̇	(yaghe) k'e	dzé	datheɬt'us «da-the-ɬ-t'us»
table	(under) on	gum	up.3SG.S.IMPF.MM.stick(glue?)

'The gum sticks on and is under the table.'

Related paradigms:
de-the-ɬ-t'us	'it is stuck on'
bet'á eɬehílt'us	'glue'
-t'us	'to glue together, to be sticky'

b.

GROUND	LOC	FIGURE	CLV[FIG]
bek'eshich'elyį̇	yaghe	dze	datheɬt'us
table	under	gum	up.3SG.S.IMPF.MM.stick

'The gum sticks under the table.'

This section indicates the encoding pattern of inferior spatial relations between the primary and secondary object. All examples are static topological relations as expressed by a postposition. The figure is not only located with respect to the ground, but located depending on the texture of the figure itself. The postposition and its locative marking is supported by the verb system as well.

Do the patterns given in the current section apply to animate figures as well? The next section provides relevant data to answers this question.

4.3.3 *Animate Figures Interior/Posterior to Ground Relations*

This section provides examples for the encoding of an animate figure being located in relation to the ground in interior or posterior locations. The schema for such spatial relations follows the idea that the primary object does not only surround the figure, but rather encloses it and also contains it. As Talmy states, the ground provides the support from underneath the figure "counter to gravity" (Talmy 1983:250).

(19)   a.   Rabbit in cage. (L3/54)

GROUND	LOC	FIGURE	POST[FIG]
dechentili	ye	gah	nadher «na-d-her»
box	in	rabbit	3SG.S.IMPF.AO.located

'The rabbit is in the box.'

      b.

FIGURE	POST[FIG]
gah	bedari̜ta̜ «be-da-ri̜-ta̜»
rabbit	3SG.S.IMPF.AO.closed.in

'The rabbit is shut in.'[25]

The figure is in a full inclusion (19a) being located in a container—a wooden box. The process of closing in the figure is emphasized in the latter example as opposed to a simple location of the primary object interior the secondary object. The cohort in (19b) conflates the general location and the qualitative features of the figure being an animate object, and no locative marks a topological relation.

The drawing in (20) presents the figure as hiding behind the ground. The data in (20b) encodes not only the posterior act of hiding behind an object but also to hide away from the girl in the presented scene. This example indicates the direction of moving away from the secondary ground as being on the opposite site, not necessary hiding behind the chair. Furthermore, we clearly see the various lexicalized and detailed information. The spatial and temporal information is carved up in a detailed way in a case in which most information is inferred by English or German speakers.

(20)   a.   Boy behind the chair. (T1/64)

GROUND	LOC	FIGURE	POST[FIG]
edáchené	tazi̜	deneuaz	eheɫʔi̜ ««h»ehe-ɫ-ʔi̜»
chair	behind	boy	3SG.S.IMPF.AOhide

'The boy hides behind the chair.'[26]

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[25] **be-** = 3SG. postpositional object/third person object of the postposition; **-ti̜** = 'to handle a living being'; **-da-** = distributive; **-ta̜'** = 'handle SO'.

[26] **he-** = inceptive; **dá-tíl-gí-l-ʔi̜** = 'We (pl.) hide (it).'

b.

GROUND₁	LOC	GROUND₂	REFL+LOC	POST[FIG]
edáchené	*Ɂuzi̧*	*tsekwaz*	*bech'azi̧*	*eheɫɁi̧*
chair	on.the.other.side	little.girl	him/her.away.from	3SG.S.IMPF.AO.hide

'The boy hides behind the chair away from the girl.'

Dene speakers encode the different participants of the scene. The distinction between a single reference object and a secondary reference object is not sufficient. Talmy describes such additional semantic information necessary here in terms of two further categories: the reference objects encompassing the primary reference object and those outside of the object (Talmy 1983:245). The main semantic function of such additional reference objects is the exact location of the figure.

The next section provides data for the encoding of an (in)animate figure in a static interior and coincident-relation.

4.3.4 (In)animate Figures Interior to Ground Relations

This section compares object X interior Y-relations for animate and inanimate figures. In (21a-b) the inanimate figure is situated as being located in a containment/encirclement position as indicated by the locative plus the classificatory verb.

(21) House around/in fence. (O2/60)

(GROUND	LOC	FIGURE	POST[FIG]
yohbarélaé	*yisi̧*	*yoh*	*hoɁą̧ «ho-Ɂą̧»*
fence	inside	building	3SG.S.IMPF.RO.lies(perfective?)

'The house is inside the fence.'[27]

The salient reference point is the house profiling the scope of the figure. The figure is in a containment location encircling the ground.

The next example in this section presents the encoding of the animated figure as coincident with the ground.

(22) a. Dog in basket. (M3/47)

FIGURE	GROUND	LOC	POST[FIG]
ɫi̧	*behteghe*	*ke*	*theda «the-da»*
dog	its.sleeping.place	on	3SG.S.IMPF.AO.sit

'The dog is sitting on its sleeping place.'

b.

FIGURE	GROUND	LOC	POST[FIG]
ɫi̧	*behteghe*	*ye*	*theda*
dog	its.sleeping.place	in	3SG.S.IMPF.AO.sit

'The dog is sitting in its sleeping place.'

In (22a) the topological location of the figure is encoded as supported by the ground indicated by the postposition *k´e* plus *theda* (positional verb). Whereas in (22b) the figure is in a containment relation to the ground expressed by the locative *ye*. Both examples present the location of an animate figure as encoded by the postposition and the locational verb in a partial containment relation.

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[27] *ho-* = 3SG.S. referring to a place, an event; thematic prefix for static verbs)

4.3.5 *Inanimate Figures Coincide with Ground Relations*

The examples in (23a-b) specify the figure's location as being supported in its position by the ground.

(23) a. Hose on treestump (draped) (A8/43)

FIGURE	GROUND		POST[FIG]
tɬule	dechen		tedhehet'i «te-d-hehe-t'i»
rope	wooden.thing		3SG.S.IMPF.AO.lie

'The rope is strung over the stump.'

Related paradigms:

the-ɬ-tį̢	'He is lying here'
the-tį̢	'S/he is lying, sleeping'
-tį̢	handle a living being; speakers indentify the rope as a snake
te-	inceptive, progressive, iterative prefix;
-d-	classifier, reflexive verbs
he-	inceptive
hehe-	dual subject forms (two identical syllables, one of which represents third person dual subject and the other a peg syllable.

b.

FIGURE	GROUND	LOC	POST[FIG]
tɬule	echįchené	k'e	daxarela «da-xa-re-la»
rope	tree/wood	on	up.3SG.S.IMPF.PO.lie(on/off; strung over)

'The rope lays on the stump.'

Related paradigms:

the-la	'inanimate thing is lying here'
-la	handle severeal objects
-re-	thematic prefix for stative verbs
-xa-	to, for, in place of it

The figure is simultaneously laying on the ground and hanging down and is both supported by the horizontal surface and in a hanging position. Accordingly, the figure is not only supported by the ground only, but extends its position. As opposed to the planar surface, the data in (24a-b) indicate how the figure is not only located with respect to a contact relation but as an attached or tied-to relation.

(24) a Balloon on stick. (H1/20)

FIGURE	GROUND	VMC[FIG]
beyeju'laze	dechen	héthetɬ'ų «hé-the-tɬ'ų»
baloon	wood	3SG.S.IMPF.FO.tie

'The balloon is tied to the stick.'[28]

b.

GROUND	GROUND	FIGURE	VMC[FIG]
dechen	beląghe	beyejuli	héɬcheth «hé-ɬ-cheth»
stick	its.end	balloon	3SG.S.IMPF.FO.tie.it

'The balloon is tied to the stick.'

---

[28] -t'ɬú = 'to lace a net, to tie (a rope)'; hé- = inceptive; 3PL./DL.S

Related paradigms:

eł é-thi-l-chedh   'I tied them (parcel, person) together.'
he-yé-ł-cheth   'They (dl.) tied it.'
hé-thi-ł-chedh   'I tied it to something.'
-ł-   pronominal subjective prefix/classifier

The figure is not located as simply being supported by the ground, but attached—tied to—it.

      The final example of this section indicates again that the relatively simple locative proposition is encoded as a motion event in profiling the figure's directional motion towards the ground. In (25) the figure is profiled as being poked through the ground. The location is semantically secondary as opposed to the direction in which the figure comes to its position by the causation of being poked through.

(25)   a.   Earring on.(B5/69)

FIGURE	GROUND	VCA[FIG]
Ɂasi	bedzaghe	húhgor «hú-h-gor»
thing	3SG.his/her.ear	3SG.S.IMPF.RO.poke.through

'The earring is poked through his/her ear.'[29]

This is even stronger for (25c) below which adds the figure's hanging position as well. The figure is not simply supported by hanging, but the event of getting into its position in being poked through is expressed also.

   b.

GROUND	GROUND	VCA[FIG]
bedzaghe	ghạ	nịge «nị-ge»
ear	hole	3SG.S.PERF.RO. poke

'The earring has been poked through his/her ear.'[30]

   c.

GROUND	FIGURE+LOC	LOC	FIGURE	POST[FIG]
bedzaghe	ghạghịge	k'e	tsatsabạdhaz	naghebeł «na-ghe-beł»
ear	3SG.S.poked.hole.through	on	round.iron.thing	up.3SG.S.PERF.RO.hang

'The earring that has been poked through, hangs on his/her ear.'

All three examples indicate that not the bare result—*earring on ear*—of a spatial position is at issue but the process of how the figure gets into its location. Again, it seems that the static drawing in itself does not evoke the semantic event of a process, but it is necessary for the speaker to contextualize the idea of dynamicity and perspective. In example (25c) the figure is supported by hanging and profiled as an event in which a causer is implied. Strictly speaking, these expressions are not topological in the core sense because of the implied motion event being inherently dynamic. This is expressed by the verb system *to poke through* itself implying a motion event. The location is secondary and the figure's profile is the movement.

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[29] *yé-gor* = 'He poked him (with a needle).' 'He speared it.'; *hú-* = optative/inceptive; *pointing at, towards, again*
[30] *húnesege ha* = 'I will poke him.'; *nị-* = terminative, 'arriving at'; postposed particle denoting past tense, or an event or thing in the past; *ni-* = 'up'.

4.4 *Projective Figure-Ground Relations*

This section provides several encoding patterns entitled as projective relations. These examples are of particular interest since they challenge a general projective orientation, e.g., right-left asymmetry, of the figure being located in relation to the ground. In all four cases below the orientation is contextualized in terms of the actual modified perspective dependent on the focal point of the speaker, i.e., a relative orientation and an intrinsic orientation of the figure.

The examples in (26) indicate an anterior location as indicated by the tree as standing in front of the church.

(26)   a.   Tree in front of church. (U1/49)

FIGURE	LOC	GROUND	POST[FIG]
k'es	gah	yałtikóę̨	hóʔą̨ « hó-ʔą̨»
poplar	close/near/beside	church	3SG.S.IMPF.RO.lies(handle round solid object)

'The tree is beside the church.'[31]

b.

FIGURE	LOC	GROUND	POST[FIG]
k'es	ʔuzi̜	yaltikóę̨	nághę̨ʔa «ná-ghę̨-ʔa»
poplar	on.the.other.of	church	in.place.of.3SG.S.PERF.SO.stand(to have extension)

'The tree is on the other side of the church.'[32]

c.

FIGURE	LOC	GROUND	LOC+POST[FIG]
łałéskóę̨	tsy̜k'edhe	k'es	nághi̜ʔa « ná-ghi̜-ʔa»
church	blocking.vison	poplar	in.place.of.3SG.S.PERF.SO.stand(extends)

'The church is blocked because of the tree (that itself stands upright).'

d.

FIGURE	LOC	GROUND	POST[FIG]
yałtikóé	ghą̨łk'edhé	k'es	nághi̜ʔa
church	close.to/near.blocking.vision	poplar	in.place.of.3SG.S.PERF.SO.stand(extends)

'The church is blocked because of the tree standing nearby.'

ná-: front(PP)/ in.place.of?

The results in (26a) indicate the speaker's use of a particular kind of contextualized intrinsic frame of reference (Levinson 2003). It is not simply an *in front of* relation between the primary and secondary object as we see in English or German using a relative frame of reference (the human body serves as the anchor for orientation). The speakers encode a figure-dependent construal where the entrance of the church is profiled as the initial focal point. The reference object is the church's entrance, i.e., it has an inherent focal point. We also see a figure ground reversal in (26c-d) where the natural object serves now as the point of reference.

Finally, example (26c-d) express more specifically the type of tree and especially (26d) indicates and use the idea of the other side of the building. Such an expression is known as non-biased geometry as opposed to a biased geometry (Talmy 1983:240). These examples exemplify how the secondary reference point serves as a geometric focal point that indeed singles out a certain portion of the figure being located that is nearest to the reference point (Talmy 1983:150).

The next set encodes a lateral location of an animate figure as proposed by the drawing.

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[31] *hó-* = 3SG.S./O. referring to a place, an event; *hó-ʔą̨* = 'It is there (place, event).'; *the-ʔą̨* = 'It (a rock) lies there.'

[32] *ná-* = 'in place of (pp)'; continuative, 'here and there', 'about'; 'in front of'?.

(27)   Dog next to kennel. (W2/6)

FIGURE	GROUND	LOC	POST[FIG]
łį	*łįkǫé*	*gah*	*theda* «the-da»
dog	dog.house	close/near/beside	3SG.S.IMPF.AO.sit

'The dog sits beside the dog house.'

The figure is in a proximity relation to the ground. The same spatial relation pattern is consistent for example (28a-b) in which the figure is in a lateral position to the ground. In both data sets the figure is encoded by the stem in a general orientation. The lateral specification is encoded by the postposition *gah*.

(28)   a.   Boy next to fire. (W1/38)

GROUND	LOC	POST[FIG]
kón	*gah*	*theda* «the-da»
fire(outside)	close/near/beside	3SG.S.IMPF.AO.sit

'The boy sits next to the fire.'

        b.

FIGURE	GROUND	LOC	POST[FIG]
chelekwaz	*kón*	*nih*	*theda*
young.man	fire(outside)	light/warmth.of	3SG.S.IMPF.AO.sit

'The boy sits in the light (in a certain distance to) of the fire.'[33]

The data indicate how the animate figure is situated in a lateral or proximity locational relation expressed by the basic orientational positional verb stem *-da* plus prefix plus a locative. The most interesting example here is (33b) in which we see an exact positioning depending on the ground's physical qualities implying that someone sits in the vicinity of it. The fire imposes a specific range or distance because of its heat that determines where someone can sit by a fire without getting burnt in fact.

4.5 *Miscellaneous Figure-Ground Relations*

This final section provides a collection of various cohorts indicating several spatial relations of different figure-ground asymmetries. The data presented here give evidence that certain so-called spatial topological relations are not purely based on topological coordinates in Dene. Space might simply not be the main coordinate to encode supposedly spatial relations at all, and is therefore a secondary parameter.

       The next set expresses not only a general inferred location of the figure to the ground, but encodes a causation of an indicated event of an inanimate object. In general, it seems that tied-to relations in Dene are not locational, and therefore are not about space in the first place.

(29)   a.   Flag on mast. (B2/56)

holąnįbale	*gheshel* «ghe-shel»
flag	3SG.S.IMPF.FO.float(because.by.air)

'The flag moves/floates (uncontrolled motion (caused by the wind)).'

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[33] *nih-* = 'vicinity of'/'close range to', 'in the light of/heat of'.

Related paradigms:
ghi-s-húɫ   'It was blowing (it).'
he-s-shúl ha   'I will be blowing (it).'
ghe-l-eɫ   'He is floating.'
-shel   'RO moves in uncontrolled manner.' ('to toss up with a pole')

b.

GROUND	GROUND	LOC	VFM[FIG]
yeholanįbąle	*chené*	*k'e*	*ghesheɫ*
flag.pole	stick	on	3SG.S.IMPF. FO(?).float(because.of.air)

'The flexible object floats on the flag pole.'

c.

FIGURE	GROUND	LOC	POST[FIG]
sųnibanaz	*dechen*	*k'e*	*datheɫchúdh* «da–the–ɫ–chúdh»
ribbon	wood	on	up.3SG.S.IMPF.FO.situated

'The ribbon is on the wood.'

In (29a) the ground is not mentioned and we see that only the figure is profiled as being not in an attached-to-the-ground location. In parallel, the verb encodes the potential motion of the figure because of its texture. The verb stem in (29a-b) profiles the causer of the motion as well in specifying the source of it. It is not a topological relation only, but profiles the movement of the figure. The spatial relation is inferred by a general knowledge implying that a flag is usually bound to a pole in a certain position. Example (29c) is a topological relation in which a flexible object is located to the wood.

As opposed to the inanimate figure in the previous example, the set in (30) presents the animate figure encircled by the ground.

(30)   a.   Fish in bowl.(L2/32)

FIGURE	GROUND	LOC	VFM[FIG]
ɫuaz	*tutili*	*ye*	*dzírélbį* «dzí–ré–l–bį»
fish	vessel	in	3SG.S.IMPF.AO.swim.around

'The fish swims around in the vessel.'

Related paradigms:
dzé-ré-li   'It is floating around.'
dzé-re-   swimming around
dzí-ré-l-bį   swimming around

b.

FIGURE	GROUND	LOC	VFM[FIG]
ɫuaz	*tth'ai*	*ye*	*ghebeɫ* « ghe-beɫ»
fish	bowl	in	3SG.S.IMPF.AO.swim(float?)

'The fish is swimming in the bowl.'

The basic semantic information about the primary object is not the mere location in an enclosed container, but the profiling of the general movement of the figure being located. The figure's motion is profiled by the classificatory verb *dzirebį*. Again, in this case the speakers are explicitly asked to relate the two objects presented by the drawing. It turns out that the spatial relation is secondary as opposed to the event.

(31) a. Crack in cup. (R2/26)
          FIGURE   VMC[FIG]
          tt'ha'aí   nágheté «ná-ghe-té»
          cup   3SG.S.PERF.SO.break
          'Broken cup (it is broken).'[34]

      b. GROUND   VCA[FIG]
          liditt'h'aí   húɬtáɬ «hú-ɬ-táɬ»
          tea.cup   3SG.S.PERF.SO.break.(because.of.tension, depends on the material)
          'The cup is cracked (because of tension).'

          Related paradigms:
          yé-ɬ-táɬ   'He broke it (rope-like thing).'
          he-ɬ-taɬ   'The ice is cracked (with one small crack).'
          hú-   optative (in this case?)/inceptive; 'pointing at',
                            'towards', 'again'
          -táɬ   'to break (strings into pieces by pulling or jerking), to 'crack', 'to be cracked'

In both cases, no explicit spatial topological relation is encoded. The ground does not only support the figure, but encodes both objects as being inseparable amalgamed. Even asking the speakers several times, they still use these patterns to encode the process of cracking or breaking of a container. In addition, the stem in example (31b) profiles the general causation of how the cup comes to its state of being cracked because of its material's tension.

The very last example in this paper presents several construction type patterns of one scene. The figure is not only situated or supported by the ground, but its moving event is profiled. A general topological relation is inferred since the scene presents a physical contact between the figure and the ground.

(32) a. Boat on water. (A12/11)
          FIGURE   VFM[FIG]
          ts'i   ghe?úɬ « ghe-?úɬ»
          boat   3SG.S.IMPF.SO.float(being.on.water) (uncontrolled motion)
          'The boat floats on water.'

          Related paradigms:
          dá-na-re-ghí-l-?úɬ   'We (PL.) are floating them.'
          kón na-re-ghe-ɬúɬ   'He is rafting/floating wood.'
          na-re-ghe-s-?úɬ   'I was floating them.'

      b. FIGURE   LOC/GROUND   POST[FIG]
          ts'i   tusį́   thetą «the-tą»
          boat   into.water   3SG.S.IMPF.SO.situated
          'The boat is in water.'

In (32a) the movement of the figure is profiled. The ground is inferred since floating implies that an object is moving on or in water. Moreover, a general location of the figure is inferred, but not lexicalized by a morpheme as in English *the boat floats* or German *das Boot schwimmt*. The example in (32b) locates the

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[34] *be-k'e-té* = 'It broke off (stick-like thing).'; *-té* = 'to break into pieces (anything brittle)'; *ná-* = continuative; move downward from up?; 'in place of' (PP); continuative, 'here and there', 'about'; 'in front of'?

primary object as basically being in the water. The postposition profiles and conflates the location and the ground on liquid surface. As opposed to (32a), no motion is indicated, hence a posture verb is used. The example in (32a) encodes a certain movement, but the following two examples encode even the causation of the motion. In (33a) the figure is profiled in a general movement, and the causation of the motion event in particular.

(33) a. | FIGURE | GROUND | VFM[FIG] |
|---|---|---|
| ts'inįbale | t'a ts'i | gheshił |
| boats.sail | because.of.boat | 3SG.S.IMPF.INCHOATIVE.SO.(RO?)float(because.of.air) |

'The boat is floating because of the wind (wind causing the motion).'[35]

b. | FIGURE | LOC | VFM[FIG] |
|---|---|---|
| ts'nįbalits'i | k'e | gheshił |
| sail | on | 3SG.S.IMPF.INCHOATIVE.SO.(RO?)float(because.of.air) |

'The sail is floating because of the wind.'

The drawing presents the figure as located in a topological relation on the ground, i.e., supported by it. The spatial relation is motivated by the physical supporting function of the ground in relation to the figure. In the examples (33a-b) however, different figure-ground relations are profiled. The speakers profile the causation of the motion and the locative in (33b) expresses rather a temporal event in coalition with the inchoative event (as opposed to the ingressive one) where the verb indicates the beginning of an event. This might be due to the fact that extra-linguistic knowledge is implied. Prototypically, a boat is moved by the wind blowing at its sail. This is encoded and profiled in the present examples. We see in these examples, that Dene lexicalizes the various causations explicitly by a verb whereas in English or German we infer this knowledge. A default spatial relation is given in assuming that the figure—*the boat*—is typically moving on a liquid surface. This information is not necessary for an English or German speaker since s/he idealizes the fact of the causer in this motion event (as seen in a pilot study). This data set indicates that the speakers profile a salient reference point that varies depending on the profiled entities in a contextualized context.

This section presented the contextualization of certain supposedly static spatial situations as dynamic events. For example, the profiling of the causer or the source of a motion event is predominant as in the *boat on water* example. The Euclidean geometrical coordinate system does not reveal the semantic parameters in describing the scenes as presented by the drawings since the figure is inherently a dynamic entity.

5. CONCLUDING REMARKS

The present paper presents an initial cognitive semantic description of spatial topological relations in Dene. Using the *Topological Relations Picture Series* instrument developed by Pederson et al. (1998), the semantic scope of certain spatial relations has been determined. The hypothesis outlined in the introduction that such relations cannot be described purely on Euclidean grounds has been supported by the data. The spatial encodings of the relations between static figures and grounds are not coded in Dene in the same way as in most Germanic languages. If indeed spatial language is used, it is in most cases inclined to encode a rather dynamic and perspectivized construal than a more static and objectivized one. The data indicate the considerable richness of the semantic scope in the encoding of space in Dene and indicate that the semantics of topological relations does not necessarily rely only on space as a parameter. Indeed, space is often only a secondary coordinate feature.

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[35] *ghe-l-eł* = 'he is floating'; *-shel* = RO moved in uncontrolled manner

In particular, the usage-based approach indicates that certain encoding patterns of spatial expressions are of a rather dynamic character. Moreover, this survey links up linguistic and extra-linguistic factors and their interplay as playing an important part in the construction of meaning and the conceptualization of spatial relations in particular. Current models of spatial relations propose a consistency across languages in terms of how objects of a scene are related, i.e., mainly geometrical features trigger the relation. In using the *Picture Book*, the complex interplay between conceptual reasoning, language, culture, and contextual factors has been exemplified. This initial test reveals evidence against the common sense that the encoding of spatial relations comes in a nice idealized package as provided by Euclidean geometry (Frawley 1992 gives such an idealized perspective). Indeed, the viewing arrangement imposed onto the various scenes indicates that the degree of specificity of the language profiled the participants in a scene depending on various imaging parameters along to the two major concepts of the figure and ground. Hence, we see that the scope, scale, size, texture or material and the animate/non-animate features do matter in the construction of the viewing arrangement that itself depends on the speaker's imposed perspective in the construed stage model.

One outcome of the current research is that space and topological relations specifically are not sufficiently describable in terms of Euclidean geometry, but are contextualized events depending on the speaker's experiences, hence they are not merely topological. The figure-ground asymmetries cannot always be traced back to a natural larger background. The importance of the substance for both salient entities and the functional component of the involved primary and secondary objects has been singled out. In addition to the instantiation of the participants in a particular viewing arrangement the trajectory of the figure is of specific scope in many cases. This is profiled by the locative plus classificatory verb cohort and infers extra-linguistic knowledge to the figure-ground asymmetry.

We have seen that Dene imposes language-specific affordances due the high degree of specificity that is expressed via the lexicalization in a dense qualitative cohort structure. The language is very precise in the description of the various figure-ground asymmetries presented in this paper, hence we have seen that the verb stem and its vast amount of prefixes profiles the figure on various morphosyntactic and semantic levels. Moreover, a range of different imaging parameters has been outlined that profile the viewer arrangements in the construal of topological spatial relations.

Finally it should be noted that we might simply have a task effect here where the rather unnatural and idealized task prompts a vast range of utterances. Nevertheless we see that even these idealized situations are construed based on language-specific parameters that do indicate that topological spatial relations might only be secondary. Since speakers were often hesitant to identify the objects displayed by the drawings, I have developed the Spatial Categorization Elicitation Tool (SPACE) trying to capture more natural situations in using familiar objects like stones, trees, water etc (Thiering 2005; Thiering 2006).

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7. APPENDIX

7.1 *Summary and Description of the most Frequent Verb Stems*

(Taken form the electronic data corpus, Department of Linguistics, University of Alberta; Dr. Sally Rice, Daghida Project, and authors fieldnotes)

Verb Stem	Classification
–ʔá....–ʔą.....	HANDLE RO
	(controlled)
–ʔą, –ʔą́, –ʔą́ ‹∅› 'a round solid object lies' (neuter); ‹ɬ› (causative)	
–ʔáiʔ, –ʔą, –ʔaɬ, –ʔaiʔ, –ʔaɬ ‹∅› 'to handle a round solid object; ‹ɬ› 'to find, search for'	
–ʔa, –ʔá, –ʔá ‹∅› ‹ɬ› 'to handle, to own a round solid object' (continuative forms)	

uncontrolled variant:
–shuɬ, –shél, –shúɬ, –shíɬ, –shéɬ ‹ɬ› 'to throw a stone; to hit, knock with a stone; ‹l› to fall on one's face'

–ʔa, –ʔą	HANDLE RO
–ʔą, –ʔą́, –ʔą́ ‹∅› 'a round, solid object lies' (neuter); ‹ɬ› (causative)	
–ʔa, –ʔá, –ʔá ‹∅› 'to handle, to own a round, solid object' (continuative forms)	
–ʔáiʔ, –ʔą, –ʔąɬ, –ʔáiʔ, –ʔaɬ ‹∅› 'to handle a round, solid object'; ‹ɬ› 'to find, search for'	
–ʔą	RO EXIST, STAND
	(also abstract object)
–ʔą, –ʔą́, –ʔą́ ‹∅› 'a round, solid object lies' (neuter); ‹ɬ› (causative)	
–ʔa, –ʔá, –ʔá ‹∅› 'to handle, to own a round, solid object' (continuative forms)	
–ʔáiʔ, –ʔą, –ʔąɬ, –ʔáiʔ, –ʔaɬ ‹∅› 'to handle a round, solid object'; ‹ɬ› 'to find, search for'	
–ʔer.....–ʔer	H A N D L E F O
	(uncontrolled)
–ʔar, –ʔar, –ʔar, –ʔay ‹∅› 'to throw, handle violently cloth-like object'	FO = flat, flexible object

controlled variant:
–chúdh, –chúdh, –chúdh ‹ɬ› 'a fabric lies (neuter)'; ‹ɬ› (causative)
–chuth, –chúdh, –chuth, –chith, –cheth ‹ɬ› 'to handle fabric'
–chúdh, ..., –chúdh ‹ɬ› 'to handle fabric' (continuative forms)

–ʔúɬ, –ʔáɬ	FLOAT PO
–ʔel, –ʔéɬ, –ʔúɬ, –ʔúɬ ‹∅› 'several persons float'; ‹l› 'several persons swim'	
–chúdh....–chuth.....	HANDLE FO
	(controlled)
–chúdh, –chúdh, –chúdh ‹ɬ› 'a fabric lies (neuter)'; ‹ɬ› (causative)	
–chuth, –chúdh, –chuth, –chith, –cheth ‹ɬ› 'to handle fabric'	

–chúdh, ..., –chúdh ‹ɬ› 'to handle fabric' (continuative forms)

uncontrolled variant:
–ʔar, –ʔar, –ʔar, –ʔay ‹∅› 'to throw, handle violently cloth-like object'
–chuth, –cheth; –chudh, –chúdh

TIE BUNDLE,

–tcedh, , –tcedh, –tcedh ‹ɬ› 'to tie into a bundle with string';
–tceth, , –tcedh, –tceth, –tcith ‹l› 'to tie with a string, to stretch'
–da, –ke, –tth'i (SG, DU, PL)

HANDLE FO

SIT, REST, FISH,

–da, –dá, –dá, –daiʔ ‹∅› 'to be in a sitting position' (neuter; SG only); ‹ɬ› (causative; SG only)
–dáiʔ, –da, –dá, –daiʔ ‹∅› 'to sit' (SG only)

MARRY, GET UP

–ke, –ké ‹∅› 'to be in a sitting position' (neuter; DU only); ‹ɬ› (causative; DU only)
–kéiʔ, –ke, –ké, –kéiʔ ‹∅› 'two persons sit' (DU only)

–tth'i, –tth'í, –tth'í ‹l› 'to sit (PL only)
–da

MOVE, ROCK

–da, –dạ, –da, –dáiʔ, –dáiʔ 'to move (intr); to move one's self ‹ *d + na 'to move' (tr)
–déɬ....–del.....

HANDLE PO
(uncontrolled)
PO = plural objects
(regardless of shape or
constituency)

–déɬ, –del, –deɬ, –díɬ ‹ɬ› 'to throw several objects'

controlled variant:
–le, –la, –leɬ, –li, –leɬ ‹∅› 'to handle several objects'
–ye, –ya, –ye, –yeɬ, –yi, –yeɬ ‹l› 'to handle several objects; to kneel down (to put the knees on something; to put on clothing; several persons come (with their buttocks)'
–dí, –di (SG, DU)

HANDLE

–ní, –ni (PL)

SOMETHING

–ní, –ni ‹∅› 'to handle something (anything, without referring definitely to what'
–dzái....–dzai.....

HANDLE GO
(controlled)
GO = grain-like,
granular object [loose-
textured pile?]

–dzáy, –dzáy, –dzáy ‹∅› 'grain-like object lies (neuter)'; ‹ɬ› (causative)
–dzáiʔ, –dzáy, –dzáiʔ, –dzaiʔ, –dzaɬ ‹∅› 'to handle grain-like object'
–dzáy, ..., –dzáy ‹∅› 'to handle grain-like object' (continuative forms)

uncontrolled variant:
–tsír, –tser, –tsir, –tsiy ‹∅› 'to throw sand, grain-like object'
–ge, –gé

POKE, DIG

–gghes, –gghez, –gghes, –gghis ‹ɬ› 'to push with a stick, held vertically or slightly slanting but moving with its end horizontally' HOCKEY VERB??

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–ggher, –gghé, –ggher   <∅> 'to spear at, to poke, to chisel'
–xáɬ....–xél.....

–xáɬ, –xel, –xáɬ, –xáiɬ   <ɬ> 'to throw a club, a stick, etc.'; 'to hit with a club, to club'

controlled variant:
–tą, –tą́, –tą́, –tį́, –tį́ɬ   <∅> 'a long, stick-like object lies (neuter)';   <ɬ> (causative);   <ɬ> ' vessel (kettle, boat, etc.) lies' (neuter)
–tį́, –tą, –tą́, –tį, –tįɬ   <∅> 'to handle a long, stick-like object';   <ɬ> 'to handle a sack, kettle, box'
–ten, –tą, –tą́   <∅> 'to handle a long, stick-like object';   <ɬ> 'to handle a sack, kettle, box, etc.' (continuative forms)
–kéth, –kedh, –kéth, –kúth, –kʷoth   <∅> 'a long object drops, moves';   <ɬ> 'anything in a sack drops'
–xes....–xéz.....

–xes, –xéz, –xes, –xis   <ɬ> 'to knock down, press down'

controlled variant:
–tą, –tą́, –tą́, –tį́, –tį́ɬ   <ɬ> 'vessel (kettle, boat, etc.) lies' (neuter)
–tį́, –tą, –tą́, –tį, –tįɬ   <ɬ> 'to handle a sack, kettle, box'
–ten, –tą, –tą́   <ɬ> 'to handle a sack, kettle, box, etc.' (continuative forms)

–lą, –lą́

–lą, –lą́   <∅> 'to be many, numerous'
–le....–la.....

–le, –la, –leɬ, –li, –leɬ   <∅> 'to handle several objects'
–ye, –ya, –ye, –yeɬ, –yi, –yeɬ   <l> 'to handle several objects; to kneel down (to put the knees on something; to put on clothing; several persons come (with their buttocks)'

uncontrolled variant:
–déɬ, –del, –deɬ, –díɬ   <ɬ> 'to throw several objects'
–le, –laɬ

–lé, –le, –laɬ   <∅> 'to dive, to swim under water'
–leɬ, –lár

–leɬ, –leɬ, –leɬ   <∅> 'to be floating'
–lár   <∅> 'to float'
–dlár, –dlar, –dlaɬ   <d> 'to float'
–lez, –les

–lez, –lez, –lez   <∅> 'to urinate; to pour down in a stream' (intr);   <ɬ> (tran)
–ne.....–nagh....

HANDLE SO/EC

(uncontrolled)

SO = sticklike object;
EC = empty container,
plate

HANDLE CC
(uncontrolled)
perhaps this
"uncontrolled" event
stem has been
reanalyzed as the CC
uncontrolled stem?

CC = closed-container
[with or without
contents?]
BE MANY

HANDLE PO

(controlled)
PO = plural objects
(regardless of shape or
constituency)

SWIM UNDER

WATER

FLOAT

DRIP, LEAK

HANDLE AO

–ne, –nagh, –ne, –naiʔ ‹∅› 'to throw a body (dead or alive)'

–naiʔ, –naiʔ, –naiʔ, –naiʔ ‹∅› 'to throw one down (in wrestling)'

controlled variant:

–teiʔ, –tį, –té, –teɬ, –teiʔ, –teɬ ‹∅› 'one living being lies down' (neuter);

–teiʔ, –tį, –té, –teɬ, –teiʔ, –teɬ ‹ɬ› 'to handle a living being'

–te, –tį, –té ‹ɬ› 'to handle a living being' (continuative forms)

–tez, –téz, –tez ‹∅› 'two or more persons are lying' (neuter); handle grain-like object'

–tés, –tez, –tés ‹∅› 'two or more persons lie down'; ‹ɬ› 'two or more animals are lying' (neuter)

–ní....–ni.....

–ní, –ni ‹∅› 'to handle something (anything, without referring definitely to what)'

–ni, –ni, –ni ‹∅› 'to handle around' (repetitive forms)

–níy, –níy, –níy ‹∅› 'to handle, to treat'

uncontrolled variant:

–xáɬ, –xel, –xáɬ, –xáiɬ ‹ɬ› 'to throw a club, a stick, etc.'; t'o hit with a club, to club'

–niɬ....–nel.....

–niɬ, –nel, –niɬ, –niɬ, –neɬ ‹∅› 'to pour, spill'

controlled variant:

–ką, –ką́, –ká ‹∅› 'a vessel (with liquid/contents in it) lies (neuter)'; ‹ɬ› (causative)

–káiʔ, –ką, –káɬ, –kaiʔ, –kaɬ ‹∅› 'to handle liquid (etc.) in a vessel'

–ka, ..., –ká ‹∅› 'to handle liquid (etc.) in a vessel' (continuative forms)

–niɬ

–niɬ, –nel, –niɬ, –niɬ, –neɬ ‹∅› 'to pour, spill'

–shúɬ....–shél.....

–shuɬ, –shél, –shúɬ, –shíɬ, –shéɬ ‹ɬ› 'to throw a stone; to hit, knock with a stone; ‹l› to fall on one's face'

controlled variant:

–ʔą, –ʔą́, –ʔą́ ‹∅› 'a round solid object lies' (neuter); ‹ɬ› (causative)

–ʔáiʔ, –ʔą, –ʔaɬ, –ʔaiʔ, –ʔaɬ ‹∅› 'to handle a round solid object; ‹ɬ› 'to find, search for'

–ʔa, –ʔá, –ʔá ‹∅› ‹ɬ› 'to handle, to own a round solid object' (continuative forms)

–tą....–tį́.....

–tą, –tą́, –tą́, –tį́, –tį́ɬ ‹ɬ› 'vessel (kettle, boat, etc.) lies' (neuter)

(uncontrolled)

HANDLE UO
(controlled)
UO = unspecified object
UO lie, exist, be-at-rest

HANDLE OC
(uncontrolled)
OC = open container,
usually filled with liquid

HANDLE LIQUID

fill (s.th.) with liquid

H A N D L E   R O
(uncontrolled)
RO = round, compact,
solid object

HANDLE CC
(controlled)
CC = closed-container

–tį́, –tą, –tą́, –tį, –tįɬ ‹ɬ› 'to handle a sack, kettle, box'
–ten, –tą, –tą́ ‹ɬ› 'to handle a sack, kettle, box, etc.' (continuative forms)

<u>uncontrolled variant:</u>
–xes, –xéz, –xes, –xis ‹ɬ› 'to knock down, press down'
–tą....–tį́.....

–tą, –tą́, –tą́, –tį́, –tįɬ ‹∅› 'a long, stick-like object lies (neuter)'; ‹ɬ›
(causative); ‹ɬ› ' vessel (kettle, boat, etc.) lies' (neuter)
–tį́, –tą, –tą́, –tį, –tįɬ ‹∅› 'to handle a long, stick-like object'; ‹ɬ› 'to handle
a sack, kettle, box'
–ten, –tą, –tą́ ‹∅› 'to handle a long, stick-like object'; ‹ɬ› 'to handle a sack,
kettle, box, etc.' (continuative forms)
–kéth, –kedh, –kéth, –kúth, –kʷoth ‹∅› 'a long object drops, moves'; ‹ɬ›
'anything in a sack drops'

<u>uncontrolled variant:</u>
–xáɬ, –xel, –xáɬ, –xáiɬ ‹ɬ› 'to throw a club, a stick, etc.'; t'o hit with a club,
to club'
–tí....–tį.....

–teiʔ, –tį, –té, –teɬ, –teiʔ, –teɬ ‹∅› 'one living being lies down' (neuter);
–teiʔ, –tį, –té, –teɬ, –teiʔ, –teɬ ‹ɬ› 'to handle a living being'
–te, –tį, –té ‹ɬ› 'to handle a living being' (continuative forms)
–tez, –téz, –tez ‹∅› 'two or more persons are lying' (neuter); handle grain-
like object'
–tés, –tez, –tés ‹∅› 'two or more persons lie down'; ‹ɬ› 'two or more
animals are lying' (neuter)

<u>uncontrolled variant:</u>
–ne, –nagh, –ne, –naiʔ ‹∅› 'to throw a body (dead or alive)'
–naiʔ, –naiʔ, –naiʔ, –naiʔ ‹∅› 'to throw one down (in wrestling)'
–tį́, –tą

–tį́, –tą, –tą́, –tį, –tįɬ ‹∅› 'to handle long, sticklike object'; ‹ɬ› 'to handle a
sack, kettle, box (CC)'
–tį, –tį́

–, –, –, – ‹∅›

–tth'i, –tth'er

–tth'ir, tth'er, –tth'ir, –tth'iy, –tth'eɬ ‹l› 'to fall'
–tth'i, tth'í, –tth'iy, –tth'iy ‹l› 'to start to fall'
–tth'er ‹l› 'to be shaky (be loose from its base)'
–tthi, –tthiɬ

–tthi, –tthiy, –tthi, –tthi, –tthiɬ ‹∅› 'to push (a stick); to poke; to point
(with one's finger)'; ‹ɬ› 'to stick up a stick'

[with or without
contents?]
CC lie, exist, be-at-rest

HANDLE SO/EC

(controlled)

SO = sticklike object;
EC = empty container,

plate

SO lie, exist, be-at-rest

HANDLE AO

 (controlled)
AO = animate being
[human or animal,
excluding dead body]

AO lie, exist, be-at-rest

HANDLE CC

haul water (in one pail)

LEAN AGAINST

lay, lean, recline against

(it)

FALL

POKE, POINT, STICK

stand it up (knife, stick,

pole)

–tɬʼé....–tɬʼegh.....

–tɬʼegh, –tɬʼegh, –tɬʼegh   ‹∅› ʻa sloppy mud-like objectʻ liesʻ

uncontrolled variant:
–tɬʼegh, –tɬʼegh, –tɬʼegh   ‹∅› ʻa sloppy mud-like objectʻ liesʻ
–tɬʼé....–tɬʼegh.....

–tɬʼegh, –tɬʼegh, –tɬʼegh   ‹∅› ʻa sloppy mud-like objectʻ liesʻ

controlled variant:
–tɬʼegh, –tɬʼegh, –tɬʼegh   ‹∅› ʻa sloppy mud-like objectʻ liesʻ
–tsir.....–tser

–tsír, –tser, –tsir, –tsiy   ‹∅› ʻto throw sand, grain-like objectʻ

controlled variant:
–dzáy, –dzáy, –dzáy   ‹∅› ʻgrain-like object lies (neuter)ʻ; ‹ɬ› (causative)
–dzáiʔ, –dzáy, –dzáiʔ, –dzaiʔ, –dzaɬ   ‹∅› ʻto handle grain-like objectʻ
–dzáy, ..., –dzáy   ‹∅›   ʻto handle grain-like objectʻ (continuative forms)
–yi̜ (sg/du)
–ya (pl)
–, –, –, –   ‹∅›

Right column:
pole)
HANDLE MM
(controlled)
MM = mushy or
mudlike matter
MM lie, exist, be-at-rest

HANDLE M.M.
(uncontrolled)

HANDLE GO
(uncontrolled) GO =
grain-like, granular
object [loose-textured
pile?]

STAND