1
Introduction

GUNTER SENFT

lichtung

manche meinen
lechts und rinks
kann man nicht
velwechsern.
werch ein illtum!

Ernst Jandl

1.1. THE PROBLEM AND THE STRUCTURE OF THE BOOK

The famous German poet Friedrich Schiller, in Act ii, scene ii of his classic
drama *Wallensteins Tod*, has his protagonist, General Wallenstein, recite the
following:

Eng ist die Welt, und das Gehirn ist weit—Leicht beieinander wohnen die Gedanken,
Doch hart im Raume stoßen sich die Sachen.

With these phrases Schiller describes exactly the problem linguists and anthro-
pologists have to face in researching conceptions of space and spatial reference
in different cultures and languages. Together with Jandl's poem, this quotation
forms a kind of motto for this anthology, which presents studies on space and
spatial reference in Austronesian and Papuan languages.

In this introduction I shall first present some of the main ideas and insights
related to the phenomenon of space gained by linguists and psychologists dur-
ing their description and analyses of space concepts and spatial reference in
the familiar Indo-European languages. Although theories of space are only
based on material drawn from these languages, and on Western European—
philosophical—concepts of space, they nevertheless claim universal status.

With this universal claim in mind, I will then confront some aspects of the
theories and concepts of space and spatial reference with linguistic data on this
topic gathered in non-Indo-European languages, namely Mayan, Australian
Aboriginal, and especially Austronesian and Papuan languages.

After this confrontation of theories and facts—which questions the status of
what we think we know about space—I will reconsider what kind of theories of

space, spatial conception, and spatial reference seem tenable or promising to develop.

I will conclude with a few remarks on why I think this book, which summarizes aspects of what we know about spatial reference in Austronesian and Papuan languages, is an important contribution not only to (anthropological) linguistic research on space but also to Austronesian and Papuan linguistics, and with a brief summary of the papers presented in this book.

I.2. SOME GENERALIZATIONS ABOUT SPATIAL LANGUAGE

Behavioural physiologists, at least those such as Hermann Schöne, working in the tradition of Erich von Holst's seminal contributions to the field, seem to agree on the premiss that there is no behaviour whatsoever that is not oriented in some or other way.[1] Thus, it is only logical to state—with the psychologist Hans Hörmann—that communicative behaviour is space-oriented as well (Hörmann 1978: 311).

Whenever we use (natural) language with one another, we use it in certain situations—at a certain place and at a certain time—interacting with people 'who share a great deal of both situational perception and general knowledge' (Weissenborn and Klein 1982: 1). Thus, when we communicate we communicate in a certain context, and this context shapes our utterances. Indeed, one of the main features of natural language is its 'contextuality'—and it is in this context-boundness that language, perception, and cognition meet. All our actions—verbal and nonverbal—and all our experiences are tied to specific (times and) places (see Ehrich 1991: 5). Space, our perception of space, and our orientation in space are basic for human action and interaction in a number of domains—Konrad Lorenz even regards our spatial cognitive capacities as one of the roots for human thinking (Lorenz 1977: 21–6, 148, 156–68, 206–11; see also Weissenborn 1985: 210–11).

The intimate relation between language, perception, and cognition—especially with respect to space—is generally acknowledged in the cognitive sciences, especially in linguistics, psychology, neurology, and ethology, but also

---

[1] See Schöne (1984: 4): 'Orientation refers to the spatial organization of movements. Since movements are elements of behaviour, orientation and behaviour are intimately associated with each other . . . A behaviour pattern is the unit of behaviour and is defined as a sequence of movements characterized by a specific configuration of time and space. This underscores the special significance that spatial organization has for behaviour. Every behaviour is oriented in some way . . . Thus, we can define orientation as the process that organisms use to organize their behaviour with respect to spatial features'. For a different point of view, see Kritchevsky (1988: 111): 'Behavior must be divided into spatial and nonspatial components . . . the perception of the location of an object relative to the observer is a spatial behavior . . . whereas the perception of the color of an object is a nonspatial behavior. . . .' Remember also that the term 'orientation' has its roots in the Latin verb *oriri* 'to spring, rise, have its source, come into being, originate . . .'!

in anthropology and in philosophy, of course.[2] As always, however, the problem is how to describe this relation and how to explain the predominance of spatial concepts in human thought (see Anderson and Keenan 1985: 278; Herskovits 1986: 1).

To solve this problem we need to ask questions like the following: How can we describe and analyse what we do, how we do it, and on what basic assumptions and concepts we do it when we (verbally and non-verbally) refer to something or someone in (time and) space? How do we relate entities to one another—and how do we express this—spatial or non-spatial—relation? How do we express place-changes of entities which, for example, move from a source position to a target position? We must know why we produce, and why and how we understand, the meaning of apparently simple sentences like *May we come in?*, so nicely shown to be enormously complex by Fillmore (1975).

We can only produce and understand the meaning of sentences like this if it is clear that both speaker and hearer share more or less the same conceptions of space and if we—as speakers and/or hearers—know the context in which such an utterance is 'anchored' (Levinson 1983: 55; see also Fillmore 1975: 3, 39; Hörmann 1978: 505).[3] If we raise this question we must also immediately pose the following questions (see Fillmore 1982: 35; Klein 1990: 10): By what means does a given language enable its speakers to anchor utterances that refer to space (and time) in a given context? What do the expressions that refer to space mean? And how can they be used to form and construct a coherent, grammatical utterance? Klein (1990: 10) considers these questions as constituting the three basic problems of spatial reference which he summarizes under the headings 'referential domain', 'context (-integration)', and 'meaning of the linguistic expression'. To come closer to answers to all these different and difficult questions, we first have to consider some basic insights into the phenomenon we are dealing with here, the phenomenon 'space' (for definitional issues, see Liben 1988: 169–73).

For our species, 'space' is a structured whole; it is isotropic and three-dimensional. In our Western European tradition of thought, we consider space (not necessarily consistently) as being ego-centred, i.e. as egocentrically organized, and represented in language from an egocentric perspective (Miller and Johnson-Laird 1976: 395)—as distinctively vertical, and as interconnected

---

[2] Remember that we also have 'spatial languages' in the strict sense of the term, namely sign languages; see e.g. Bellugi (1988: 160, 180, 182); with respect to linguistics in this context, cf. also e.g. Clark (1973: 28), Denny (1985: 111, 119–121), Herskovits (1986: 1, 194), Kritchevsky (1988: 111, 130), Klein (1990: 9), Liben (1988: 173, 184), Pick (1988: 145, 155), Weissenborn (1986: 383), Wunderlich (1982: 7); for a summary of philosophical thought on 'space', see Gosztonyi (1976).

[3] For 'unanchored' sentences, see Miller (1982: 65): 'Kaplan considers a kidnapped heiress, locked in a trunk of a car, knowing neither the time nor where she is, who thinks, "it's quiet here now".' See also Fillmore (1975: 39): 'The worst possible case I can imagine for a totally unanchored occasion-sentence is that of finding afloat in the ocean a bottle with a note which reads, "Meet me here at noon tomorrow with a stick about this big".'

with respect to paths, i.e. as a topological continuum (see Wunderlich 1982: 2–5). We understand space in the framework of Euclidean geometry, which is suited to the relationships between lengths, areas, and volumes of objects which we have to consider in referring to the location of a certain object in space, referring to its place, i.e. 'the part of space it occupies' (Herskovits 1986: 33, quoting Aristotle's *Physics*). Thus, all space is relative: 'in order to specify the location of an object we must specify its location relative to something else whose position is already determined for us' (Bowden 1991: 87).

For this specification, for this spatial reference, we need a coordinate system with reference planes. We have to realize that the 'influence of our bodily experiences extends very far into our conceptual system' of space (Lee 1988: 239), because it is biology that 'provides us with three ready made planes of reference' (Bowden 1991: 88) which are needed for establishing a necessary reference-point in relation to which we can specify location—for starting from a basic reference-point or 'origo'. For us, places that we want to locate are ordered along three dimensions.

As Bowden (1991: 88–9; see also Clark 1973: 33) nicely illustrates, the 'first plane is symmetrical and runs down the centre of the body . . . The second plane . . . is asymmetrical and runs across the centre of the body . . . the third plane . . . is also asymmetrical and runs along the base of the feet.' The first plane separates left and right, the second plane separates front from back, and the third plane is the horizontal plane at ground level by means of which we distinguish objects above ground level from objects below ground level. Bowden's observation is not new, though. In 1768 Immanuel Kant (see also Watson 1979: 80–83; for an English translation of Kant, see van Cleve and Frederick 1991: 28–9) made exactly the same statement in his pamphlet against Leibniz, 'Von dem ersten Grunde des Unterschiedes der Gegenden im Raume':

In dem körperlichen Raume lassen sich wegen seiner drei Abmessungen drei Flächen denken, die einander insgesamt rechtwinklicht schneiden. Da wir alles, was außer uns ist, durch die Sinnen nur in so fern kennen, als es in Beziehung auf uns selbst steht, so ist kein Wunder, daß wir von dem Verhältnis dieser Durchschnittsflächen zu unserem Körper den ersten Grund hernehmen, den Begriff der Gegenden im Raume zu erzeugen. Die Fläche, worauf die Länge unseres Körpers senkrecht steht, heißt in Ansehung unser horizontal; und diese Horizontalfläche giebt Anlaß zu dem Unterschiede der Gegenden, die wir durch O b e n und U n t e n bezeichnen. Auf dieser Fläche können zwei andere senkrecht stehen und sich zugleich rechtwinklicht durchkreuzen, so daß die Länge des menschlichen Körpers in der Linie des Durchschnitts gedacht wird. Die eine dieser Verticalflächen theilt den Körper in zwei äußerlich ähnliche Hälften und giebt den Grund des Unterschieds der r e c h t e n und l i n k e n Seite ab, die andere, welche auf ihr perpendicular steht, macht, daß wir den Begriff der v o r d e r e n und h i n t e r e n Seite haben können.

The advantage of using the speaker her-/himself as the most natural reference-point for verbal locations is obvious: 'The very axes and planes through which

locations are specified are common to all human languages [*and to all human beings, of course*—GS], and they are constrained by and defined in relation to the human body' (Bowden 1991: 99; see also Andersen 1978: 342-3)—that body being in what Herb Clark (1973: 34, 35) called the 'canonical position', i.e. standing upright and facing forwards. Brown (1983: 136) notes that in some languages canonical postures are also related to cardinal directions; Wassman and Dasen (1994) emphasize that for the Yupno of Papua New Guinea body orientation not only is related to cardinal directions but also has much symbolic impact. For our purposes here it is enough to point out that our body provides us with the planes and coordinates with which we establish our 'deictic field' (Bühler 1934: 79 (1990: 93)), and these coordinates are constant 'because they form the basic and permanent stock of orientation of every waking person in his present situation of actual preception' (Bühler 1934: 137 (1990: 154)). Although we can perform indexing acts with our index finger, with a lifted chin or puckered lips (see Fillmore 1982: 46), we usually, and more effectively, use language for spatial reference, thus transferring information about the three-dimensional space into the one-dimensional format of language (see Ehrich 1991: 234). Our languages provide a number of means for us to do this. Philosophers refer to these means and expressions as 'indexical expressions (or just indexicals)' (Levinson 1983: 55), but in linguistics most of these means are categorized under the general heading of 'deixis'.

The term 'deixis' is borrowed from the Greek word for pointing or indicating. Discussing the etyma of the words for sign, Bühler (1934: 36-7 (1990: 44-5)) also gives *demonstratio* as the Latin translation of this Greek word, emphasizing: *demonstrare necesse est* ... (Bühler 1934: 120 (1990: 136)).

Fillmore (1982: 35) gives the following definition of deixis:

Deixis is the name given to uses of items and categories of lexicon and grammar that are controlled by certain details of the interactional situation in which the utterances are produced. These details include especially the identity of the participants in the communicating situation, their locations and orientation in space, whatever on-going indexing acts the participants may be performing, and the time at which the utterance containing the items is produced ... There are two general ways in which one speaks of deixis in natural language: first, in terms of the manner in which the socio-spatio-temporal anchoring of a communication act motivates the form, or provides material for the interpretation, of the utterance that manifests that act; and second, in terms of the grammatical and lexical systems in the language which serve to signal or reflect such anchoring. That is to say, we can either ask how speakers succeed in using their current situation for anchoring referential acts in space and time, or we can ask what grammatical or lexical materials a given language has dedicated to such purposes.

I will concentrate here on spatial deixis; with respect to the problem of space and time I refer the interested reader to the literature (see e.g. Anderson and Keenan 1985; Clark 1973: 48-50; Ehrich 1991; Fillmore 1975: 28; Lyons 1982: 114-15, 121; Weissenborn and Klein 1982; Wunderlich 1982; 1986). Ehrich

(1991: 17–21) presents a comprehensive picture of the relevant concepts, categories, and terms for deixis (see also Levinson 1994*a*; Vater 1991: 46) and what follows draws heavily upon her contribution.

Ehrich understands 'deixis' as the general term for Bühler's various *Zeigarten* or 'kinds of pointing' (Bühler 1934: 83 (1990: 97)), i.e. personal, spatial, and temporal deixis and *Zeigmodi* or 'modi of pointing' (Bühler 1934: 80 (1990: 94)), i.e. situative, anaphoric, and imaginative deixis. Ehrich also refers to anaphoric and imaginative deixis as 'discourse deixis'. Moreover, with situative deixis she distinguishes between the positional system of reference (*here* and *there* in English, *hier*, *da*, *dort* in German) and the dimensional system of reference (*before (in front of)/behind, left/right, above, below* in English).

With this differentiation Ehrich somehow continues the tradition of Bühler's ideas on deixis, though some of these ideas are not undisputed. Thus one could argue that only the positional system is deictic. The dimensional system can be seen as non-deictic, because the reference-point is provided in the utterance. However, I do not want to get involved into a discussion about the breadth or narrowness of the concept of deixis, and shall instead continue my description of deictic systems (as seen in the tradition of Bühler).

The positional system of reference localizes areas in space in relation to, and dependent on, the speaker's or the hearer's position. The dimensional system of reference defines relations in space dependent on the speaker's or hearer's position *and* orientation. Discussing these two systems, the difference between primary deixis, i.e. the primary *hic et nunc* of actual speech—or, if you like, the primary *origo* or 'O for the origin' (Bühler 1934: 102 (1990: 117)), on which speaker and hearer must have agreed, however—and secondary deixis, or secondary *origines* that are displaced, shifted or additional reference-points in the three dimensions of space (—and thus presuppose primary deixis) becomes extremely important. For, in secondary deixis, the positional and the dimensional system of reference are used differently. With respect to discourse deixis (anaphoric and imaginative deixis), the positional system disregards the speaker's/hearer's actual position in secondary deixis. With respect to the situation-independent or 'intrinsic' use of deixis, the dimensional system of reference disregards the speaker's/hearer's actual orientation in secondary deixis. Here the differentiation between deictic and intrinsic orientation or perspective comes in. Clark (1973: 46) gives the following example to clarify this distinction: Consider a speaker standing not far from the side of the car who announces: *There is a ball in front of the car*. In deictic, i.e. observer/speaker-dependent, orientation or perspective we understand this utterance as 'the ball is between the car and the speaker'. In intrinsic, i.e. observer/speaker-independent, orientation or perspective, we understand this utterance as 'the ball is near the front bumper of the car' (see also Levelt 1986). However, Ehrich (1991: 19), referring to Herrmann (1990), notes that we have to subcategorize the deictic perspective further into a speaker-oriented, a hearer-oriented, and

a third-person-oriented perspective. This differentiation recalls Bühler's differentiation of the 4 *Zeigarten* or 'kinds of demonstration' which he calls 'der-deixis [*this*-deixis] ... Ort des Ich [place of the *I*] ... Ort des Du [place of the *thou*] ... and ... jener-Deixis [*yonder*-deixis]' on the basis of Brugmann's and Wackernagel's differentiation of '*hic*-, *iste*-, and *ille*-deixis' (Bühler 1934: 83–6 (1990: 97–100)).4

Moreover, with dimensional deixis the ambiguity between deictic and intrinsic perspective is not the only crucial factor one has to keep in mind. We must also consider the ambiguity caused by different points of view from which spatial configurations can be seen. Hill (1982; see also 1978) differentiates between the mode he calls 'facing', which is similar to the observation of one's own mirror image, and the mode he calls 'aligning', which is similar to a tandem configuration. Hill claims that Indo-European languages describe static configurations using the facing mode and dynamic configurations using the aligning mode (for criticism, see Levelt 1986: 198–200).

Finally, we also have to mention that there is a difference between positional and dimensional deixis when used in indirect, reported speech. In reported speech, expressions of positional deixis must be translated from the perspective of the speaker quoted into the perspective of the person who quotes. Again, Ehrich (1991: 21) clarifies this observation with the following examples: assuming that the person who quotes and the person who is quoted are not at the same place, an utterance like *It is cold here* must be translated in reported speech into: *He said it was cold there*. With expressions of dimensional deixis this translation is not possible. Anderson and Keenan refer to these phenomena with the technical term 'relativized deixis', and emphasize that the 'nature of this process of relativization, and the syntactic and discourse contexts which condition it, are highly complex and poorly understood' (Anderson and Keenan 1985: 301).

Having mentioned most of the relevant concepts with respect to the phenomenon of deixis, I would like to deal with the actual means and systems languages offer their speakers for spatial reference. In many languages the repertoire of elementary linguistic means to refer to space encompasses

---

4 See also Goeppert (1970: 16–17): ' "Ici", "là" und "là-bas" teilen den Raum der Sprechsituation auf nach seiner Zugehörigkeit zur 1., 2., oder sogenannten 3. Person. "Ici" ist der Ort, wo ich spreche, "là" und "là-bas" sind zwar nicht "mein Ort", gehören aber zu dem Raum, den die Sprechsituation schafft als der Ort, wo du bist, mit dem ich spreche, und wo er ist, sie ist oder es ist, worüber ich mit dir spreche' [' "Ici", 'là', and 'là-bas' divide the space of the speech situation according to its affiliation with first, second, or so-called third person. 'Ici' is the place where I am speaking, 'là' and 'là-bas' are not 'my place', of course, but belong to the space created by the speech situation as the place where you are with whom I am speaking, and where he is, or she is, or it is, about whom or about what I am speaking.']. See also Ozanne-Rivierre (1987: 144–5). Tanggu, a Papuan language of the Sepik-Ramu phylum (Goam stock, Aitaitan family) spoken inland from Bogia on the north coast of Papua New Guinea, seems to make exactly this differentiation of the 'kinds of demonstration' (Bühler 1934: 83–5) in its demonstratives and personal pronouns (Lotterman 1992):

local and directional prepositions or postpositions (e.g. *at, on, in* (topological prepositions), *in front of, behind, to the right* (projective prepositions));
local or place adverbs (e.g. *here, there*);
dimensional or spatial adjectives (e.g. *high, low, wide*);
demonstratives (pronouns or adjectives) (e.g. *this, that*);
static and dynamic (motion) (deictic) verbs (or verbal roots) (e.g. *to stand, to come, to go, to bring, to take*);
presentatives (e.g.: *voici, voilà, ecce, there is*); and
   case markers.

Their function is to localize (see Wunderlich 1986: 227), to inform about, and to identify objects in space (see Fillmore 1982: 45; Bühler 1934: 146–7 (1990: 163–5)).

However, with the deictic expressions in this list we must differentiate between deictic and non-deictic usages. As Levinson (1983: 65–8) neatly illustrates, we have to distinguish two kinds of deictic usage, gestural and symbolic usage. Within non-deictic usages, we also have to distinguish anaphoric from non-anaphoric. To give examples:

This bush-knife is sharp (deictic, gestural usage)
This village stinks (deictic, symbolic usage)
I drove the car to the parking lot and left it there (anaphoric usage)
There we go (non-anaphoric usage)

Levinson (1983: 67) also gives an example where a deictic term (*there*) is used both anaphorically and deictically:

I was born in London and have lived there ever since.

But let us return to the linguistic means for spatial reference and see what kinds of system of spatial deixis they constitute. In their survey on deixis in various languages, Anderson and Keenan (1985; for criticism, see Hanks 1987) present systems of deixis that consists of two terms (e.g. English *this, that/these, those, here, there*), three terms (e.g. Latin *hic, iste, ille*), and more than three terms, e.g. Sre (spoken in Vietnam: 4 terms), Daga (spoken in Papua New Guinea, Milne Bay Province: 14 terms), and Alaskan Yup'ik Eskimo (over 30 terms). Denny (1985: 113, 117–20 (revised version of Denny 1978)) mentions 88 terms in the East Eskimo spoken in the Western Hudson Bay and on Baffin Island. Anderson and Keenan (1985: 308) conclude that 'a minimal person/number system and at least a two-term spatial demonstrative system seem to be universal'.

With respect to the development of these systems Heeschen (1982: 92), in connection with his research on the Mek languages of Irian Jaya, presents the following interesting hypothesis:

At the origin we have a pure deictic system . . . These deictics can be substituted, or accompanied . . . by a pointing gesture. The more the . . . formations assume discourse functions—i.e., the more they refer not to points in concrete space but to items previ-

ously mentioned in the linguistic context—the more they lose their potential for pointing to those things which are truly 'up there' or 'down there'.

Denny (1978: 80; see also 1985: 123–5) attempts to explain the differences between deictic systems for spatial reference as follows:

In a natural environment of non-human spaces one way to relate space to human activity is to use deictic spatial concepts, to center space on the speaker (or other participant). In a man-made environment this is less necessary—non-deictic locatives such as *down the road*, *through the door* and *around the corner* will relate space to human acts quite directly since the places mentioned are all artifacts designed to aid such acts...as the degree to which the spatial environment is man-made increases, the size of the spatial deictic system decreases.

With this—not undisputed—hypothesis[5] Denny introduces the problem of linguistic relativity into our discussion. We will return to this topic in the next section.

Having introduced a number of basic concepts with respect to space and spatial reference, we must now start to discuss the problem of how to describe the meaning of the linguistic expressions used for spatial reference.

A great many linguists and philosophers concerned with language agree upon the fact that they deal with language and linguistics 'out of a shared basic interest how language functions in context' (Jarvella and Klein 1982a: p. vii) and that they want to solve the problem of meaning in language from the basic assumption that the 'central issue is...not whether meaning is left to the context, but how it is, and how it is re-integrated from what is said and what is only signalled' (Jarvella and Klein 1982b: 1). Although an excellent anthology on the topic of 'speech, place, and action' was introduced with these basic and programmatic assumptions, the claims have hardly been substantiated yet. The difficulty of the problem is clear: let me offer some examples.[6] To interpret a preposition like *in* in the sentence *The socks are in the drawer*, we must know the meaning of the expression that encodes the spatial information given (*in* = 'contained in'); we must combine this meaning with additional information

[5] For a more modified version of this hypothesis see Ebert (1985: 266–7): 'In lokalen Sprachen werden Ausdrücke räumlicher Orientierung in der Regel spezifizierter und häufiger verwendet als in großen Sprachgemeinschaften mit einer langen Schrifttradition . . . Ich vermute daß auch in der deutschen Umgangssprache, und besonders in Dialekten, räumliche Orientierung eine sehr viel größere Rolle spielt als in der Hochsprache' ['Local languages usually use expressions of spatial orientation more specific and more frequently than big speech communities with a long writing tradition . . . I assume that spatial orientation is of much more importance in colloquial German and especially in dialects than it is in educated standard German']. For a rejection of Denny's hypothesis and for a completely different position, see Fillmore (1982: 48–9). In connection with this hypothesis, see also Brown (1983: 122–3) who argues that with the increasing mobility of people— which is characteristic of large-scale urban societies—the knowledge and use of cardinal direction terms becomes increasingly useful. But what about the Aboriginal languages and their systems of cardinal terms? For further criticism, see Levinson (1991c: 27, n. 84).

[6] The following paragraphs draw heavily on the (internal, unpublished, and undated) project description of the Reference Project at the Max Planck Institute for Psycholinguistics, and on Bartels (1991).

given in the linguistic or non-linguistic context (e.g. with the verb *are*); and it must be clear that the speaker of this sentence has more or less the same concept of space, of the 'referential domain', as the hearer. It is only with these three components of spatial reference, meaning, context, and space conception, that we can infer the function and the interpretation of an expression like *in*.

In our example we can differentiate between the entity to be situated, the 'theme' (Klein 1991: 78) or the 'figure' (Talmy 1978: 627), namely *the socks*, and the reference object or the entity in relation to which the 'theme' is situated—which is called 'relatum' (Klein 1991: 79) or 'ground' (Talmy 1978: 627), in our example *the drawer* (with respect to universal characteristics of 'figure' and 'ground', see Talmy 1983). The spatial relation between 'figure' and 'ground', or 'theme' and 'relatum', is 'being in'.

Now let us look at the following sentences:

The pin is in the box.
The key is in the door.
The thread is in the needle.
The coffee is in the cup.
The dog is in the yard.
The satellite is in space.

Although these sentences have (almost) the same syntactic structure, their meaning is different, though we find the same preposition in the sentences. The difference of meaning is due to the variation of the spatial and functional relations between the 'theme' or 'figure' and the 'relatum' or 'ground', and in the variation of spatial qualities of the 'theme' or 'figure' and/or the 'relatum' or 'ground' of these sentences. The question we have to answer here is: Has a preposition like *in* a number of meanings, or is there something like a basic, abstract meaning with a number of context-dependent derivations? There are at least three possible strategies to find an answer to this question (see Klein 1990: 16).

First, we can assume that there is unlimited polysemy, i.e. that all the various usages of an expression are listed. Second, we assume that with these expressions there is complete contextualization, i.e. a word like *in* in our examples does not have a meaning of its own; meaning is assigned to it in context only. Third—in the tradition of Frege's differentiation between 'Sinnaspekt' and 'Referenzaspekt' (Ehrich 1991: 9)—we assume that there is something like a 'basic meaning' (or a 'semantic form') that can be modified by various semantic (or cognitive) operations (into a 'conceptual structure'). These operations are mainly controlled by the context, and from the basic meaning they generate the various usages.[7]

---

7 There are two ways to understand and define the concepts 'basic meaning' (*Bedeutungskern*) and the semantic or cognitive 'operations'. For a detailed discussion, see Klein (1991: 91–3); see also Ehrich (1991: 9–12), Herskovits (1986: 39–41), and Fillmore (1982: 35–6).

Most of the more recent researchers of spatial reference in Indo-European languages try to solve the problem starting from the last-mentioned assumption. These researchers have contributed immensely to the field; however, I cannot help thinking that most of their contributions have succeeded in providing us with minutely exact and highly formalized semantic descriptions of basic meanings of—isolated—spatial expressions, while forgetting almost completely about the context. If they did consider context, it was the context of invented examples, but (at least to my knowledge) never the context of speech in natural interaction. I take this as a severe shortcoming of psychological and linguistic research on space and spatial reference so far, being convinced that Levinson (1983: 96) is right when he claims that at least 'Deixis is...not reducible in its entirety, and perhaps hardly at all, to matters of truth-conditional semantics' (see also Vater 1991: 7). I cannot agree with Herskovits (1986: 192) who, confronted with much vagueness and inconsistency in her research on prepositions in English, concludes that language has 'design defects'; on the contrary, I would argue that much of the creative, dynamic potential of a natural language lies in its features we call 'vagueness' and 'ambiguity', and that it is only our models developed for the description of natural languages that have these defects![8]

However, there is no doubt that research on spatial reference has so far resulted in a number of interesting findings. Among other things, this research has proved that the locative markers of a language impose an implicit classification on spatial configuration (see e.g. Choi and Bowerman 1991). Wunderlich (1986: 213) emphasizes man's basic need for categorization and classification, and asserts that among the most relevant acts of categorization and classification we find categorization of space and the qualities we assign to it. He concludes that the different categorization of objects in space which we find in different languages are responsible for the difficulties we have in translating e.g. prepositions of one language into another: thus we find *dans la rue*, *auf der Straße*, *on the street*, etc. (see also Denny 1985: 116; Ebert 1985: 269, Goeppert 1970). Most relevant for this kind of spatial categorization are topological relationships (e.g. proximity, inclusion, surface contact), projective relations involving alignment and perspective point (see above), Euclidean notions of space (see above), and functional notions concerning typical uses and canonical positions (see above).

I would like to finish this section with a few remarks on the possible universality of the concepts of, and insights into, space and spatial reference. I

---

[8] In this context see Bühler (1934: 320 (1990: 364)): 'We are again confronted with the fundamental fact that at all points natural language only hints at what is to be done and how it is to be done, leaving latitude for contextual indices and material clues. This must never be lost sight of ...' See also Vater (1991: 6) who emphasizes that we should not forget 'daß in der Sprache vieles "mitverstanden" wird, was nicht explizit ausgedrückt wird' ['that with language much is understood that is not expressed explicitly'].

started this section by referring to behavioural physiologists. Wunderlich (1986: 213) also argues rather plausibly from a biological perspective and states that there are semantic universals, not because space is the same everywhere, but because man's genetic equipment is the same everywhere (though he does not present evidence for these two statements). It seems that on the basis of this general premiss almost everything that is said and found in the research on spatial reference in Indo-European languages claims universal status— explicitly or implicitly. Although I will discuss these claims a little more in detail in the following sections, I would like to mention a few of the more moderate claims with respect to universals in space and spatial reference here.

I already quoted Anderson and Keenan (1985: 307), who—on the basis of their comparative studies—state that at least a two-term spatial demonstrative system seems to be universal. This is in line with Denny's claim that we may indeed find space-deictical expressions in all natural languages (Denny 1985: 113). However, we should not expect the same kind of flexibility and universality in the lexicon of the natural languages as we can expect in the human capacity for thinking (Denny 1985: 122). Some interesting evidence for the claim of universality comes from language acquisition research, especially studies on the nature of locative learning as expressed in the acquisition of locatives in English, German, Hebrew, Italian, Japanese, Portuguese, Russian, Serbo-Croatian, and Turkish (Johnston 1988). These studies show that at least in these languages locational concepts emerge in a reliable and consistent order[9] (but see Bavin (1990: 64) and also de León (1991: 5–8) for the acquisition of locatives in Warlpiri and in Tzotzil, as counterexamples to this finding!). Unfortunately, research on elementary spatial functions of the brain does not yet seem able to provide us with further insights into the topic (but see e.g. Stiles-Davis et al. 1988; Kritchevsky 1988; Zola-Morgan and Kritchevsky 1988), though it seems to be the case that the right hemisphere has a dominant role in most spatial functions of the brain. However, it seems that because of the division of our brain into two halves the world for us also seems to be divided into a right and a left half (see e.g. Paillard 1991; Robertson and Marshall 1993). It seems that, with respect to universal claims, we can expect to find that

9 See Johnston (1988: 197): '*In, on, under* and *next to* consistently preceded *between* and *in back of/in front of* for featured reference objects; these in turn preceded *in back of* and *in front of* for non-featured reference objects.' See also the literature Johnston quotes, and Johnston and Slobin (1979), Kritchevsky (1988: 144), Svorou (1986), Tanz (1980), Weissenborn (1985: 214, 226, 229; 1986: 400–3). But see also Bavin (1990: 64), who found that in Warlpiri young children distinguish an 'up/down' dimension but not 'in' as a separate concept; for these children, 'front/behind' do not represent opposites on a line between two points, even after 6;0, and 'between' is acquired before 'front' and 'behind'! See also Bowerman (1991: 19), who, comparing English and Korean acquisition patterns with respect to space and spatial reference, emphasizes: 'it is striking how quickly and easily children adopted language-specific principles for categorizing. There was little evidence that they had strong prelinguistic biases for organizing space in a particular way.' See also Choi and Bowermann (1991). For an interesting contribution on early prefigurations of spatial cognition, see Steiner (1991).

many languages do indeed 'draw on a similar set of spatial concepts when referring to the location/motion of entities in space'; but we should also keep in mind that there is remarkable cross-linguistic variability in the means used to express notions of location: 'the particular concepts used and the ways in which they are encoded vary across languages' (Becker et al. 1988: 1). Denny (1978: 78; 1985: 122) presents an interesting idea with respect to our problem. Asking the question about semantic universals within lexical systems, Denny (1978: 78) states the following:

Certainly, our examination of the English, Kikuyu and Eskimo lexicons for spatial deixis indicates that whole systems are not universal. Nor are most of the semantic variables within the system universal. At best we find the one defining variable, +/– speaker's location, as a universal. Nonetheless, there is one striking indicator of universality, i.e., all the variables in the Kikuyu system are found in the larger Eskimo system. This suggests that we may have something like the structure described for color terms by Berlin & Kay (1969): as the system expands in number of variables, new variables enter it in a certain order, so that there is a universal hierarchy of semantic variables. Some caution is in order, however, when we have only examined three languages...

In the following section I would like to present some further data on space concepts and verbal spatial reference found in other languages, especially in Mayan languages and in the languages of Oceania.

1.3. SOME INCONSISTENT FINDINGS: SPACE AND SPATIAL REFERENCE IN SOME AUSTRALIAN, MAYAN, PAPUAN, AND AUSTRONESIAN LANGUAGES

In 1957 Einar Haugen discussed two articles by Stefán Einarsson in his paper on 'The Semantics of Icelandic Orientation'. He emphasized Einarsson's findings that the Icelanders use cardinal terms (see Brown 1983) for orientation that are sometimes 'approximately correct' and sometimes 'incorrect' according to the actual compass directions. The paper shows (p. 339) that there is no contradiction within this system of orientation: each of the cardinal terms has

two...semes: one used in proximate orientation (corresponding reasonably well with the cardinal directions) and one used in ultimate orientation (for travelling, based on the four quarters of Iceland and their extreme extension in the cardinal directions). Since these two are in complementary (social) distribution and show a semantic relationship (one-to-one correspondence of orientation), they constitute only one sememe...in land or coastwise travel the existence in most places of only two possible directions of travel reduced the possibilities of landwise orientation to two, and these were chosen not in terms of the celestially observable direction of travel, but in terms of the ultimate destination of the road, as moving towards one of the four orientation areas.

Thus the Icelandic system of orientation uses cardinal terms, the usage—and the meaning—of which is dependent on the situation of use (in the paper

described as 'ultimate orientation') and on environmental factors. This system of orientation in a speech community the language of which belongs to the Indo-European language family demonstrated that with respect to orientation we find some 'exotic' concepts that do not correspond with the well-described and analysed systems of spatial reference in other languages of the same family. If, on closer inspection, we find such exotic systems in what we may call a 'familiar' Indo-European language (see also McCormack 1991: 13, 59, 136), then we must expect to find more of these (by our standards) 'exotic' systems in more 'exotic', i.e. non-Indo-European, languages. As we will see, Australian Aboriginal, Austronesian, Papuan, and Mayan languages meet this expectation.

1.3.1. Australian Aboriginal languages

Most of us know that the Australian Aborigines have very sophisticated means of finding their way in the Australian deserts. As Lewis (1976), for example, documented, we observe with Aboriginal route-finding and spatial orientation 'ecological and spiritual behavioural determinants . . . inextricably intermingled into a single spiritual/physical conceptual entity' (p. 254). Aborigines use cardinal points and 'combine directional terms with location terms'; they can visualize themselves 'at some (often distant) point of reference from where directions are given' (p. 255) on the basis of a 'kind of dynamic image or mental "map" which [is] continually updated in terms of time, distance and bearing' (p. 262).

As already indicated in the preceeding section, Anderson and Keenan emphasized that many languages have much more complex systems of spatial deictic terms than our Indo-European languages (see also Levinson 1983: 81–3). Dixon (1972: 262–5) showed for the Dyirbal language of North Queensland that its system distinguishes 'the three dimensions of space, having demonstratives that gloss as "the one above the speaker", "the one below the speaker", "the one level with the speaker" as well as distinguishing relative distance from participants' (see also Levinson 1983: 82). Dyirbal also uses the additional deictic parameter 'upriver/downriver from the speaker' in its array of demonstrative terms (see also Brown 1983: 137).

Haviland (1979) showed that Guugu Yimidhirr, besides a rather simple system of four deictics indicating 'here, there, yonder' and 'there, that's the way' (Haviland 1979: 72–3), has a spatial system which is not egocentric at all, but 'absolute' (as Isaac Newton called these systems), using a 'four-term system of roots' the meanings of which 'correspond roughly to the English compass points' (Haviland 1979: 74; 1992; for a minute analysis of the system of cardinal categories in Kayardild, another Australian Aboriginal language, see Evans 1991).

1.3.2. Mayan languages

Levinson and Brown (1993: 47) found a similar 'absolute' spatial system for Tzeltal, a Mayan language; emphasizing the parallels between the Tzeltal system and the system of Guugu Yimidhirr, they nicely summarize the essence of these so-called absolute systems:

> The Australian Guugu Yimidhirr speakers . . . [have] . . . a system of cardinal edges, reference to which replaces all (or nearly all) the relative spatial reference encoded in, for example, the English prepositional phrases 'to the left of', 'to the right of', 'in front', 'behind', 'across from'. The English speaker's space is centred, and the relative positions of objects to one another and to the speaker are coded in corresponding locutions. In Guugu Yimidhirr, objects and vectors are to the north, south, east or west, either absolutely, or relative to other reference points, which may or may not be ego. Such a system replaces a system of *relative* spatial description with a system of *absolute* angles.

Thus, as Levinson and Brown point out, Guugu Yimidhirr is an excellent example to show that the egocentric spatial system of our Indo-European languages is not the only natural linguistic system.[10]

Tzeltal—the Mayan language spoken in Chiapas, Mexico—'makes some, much more limited . . . use of an absolute system' than Guugu Yimidhirr (Levinson and Brown 1993: 48). Although there is a deictic system in Tzeltal, it is preferably not utilized for spatial description in ordinary everyday communication; Tzeltal emphasizes intrinsic description as its primary mode of spatial reference, and therefore has developed

> such a rich vocabulary of descriptors that unique reference can be efficiently achieved even within a field of view of near identical objects. This allows Tzeltal speakers to minimize the use of relational descriptions, and when employing such relational descriptions of one object vis-a-vis another, to minimize the use of deictic relata. In line with this, Tzeltal speakers do not use expressions glossing 'to the left of' or 'to the right of', and expressions glossing 'in front of' and 'behind' have highly restricted uses, while vertical 'up' and 'down' appear to be derivative concepts . . . It is as part of this tendency to 'decenter' spatial description, away from an egocentric reference point, that the absolute system of spatial reference . . . seems to make best sense . . . The Tzeltal expressions that are used in an absolute sense are, especially, the terms *ta alan* and *ta ajk'ol*, that one would . . . gloss as 'downhill' and 'uphill' respectively . . . (Levinson and Brown 1990:4.)[11]

---

[10] For a language and culture where cardinal points are virtually absent, see Giman (Teljeur 1987: 348); the Giman system of spatial orientation is discussed below).

[11] On the basis of their cooperation with Haviland and de León who do research on Tzotzil, another Mayan language which is also spoken in Chiapas, Mexico (see e.g. Haviland: 1990; de León: 1990), Levinson and Brown (1990: 31) emphasize that Mayan languages make most extensive use of intrinsic description in spatial reference: 'rich object-characterization is the dominant Mayan solution to referent selection.' This explains why Mayan languages have what Brown (1990: 1, 4) calls 'highly . . . hyper-trophic . . . linguistic resources for handling spatial concepts', namely 'existential locative expressions with *ay* . . . deictics . . . positional adjectives . . . body-part locatives . . . motion verbs, directionals and auxiliaries' (see also Haviland 1990). For more detailed information on spatial conceptualization in Mayan languages see the contributions in Haviland, Levinson (1994).

There are a number of different uses of the notions of, and terms for, 'uphill' and 'downhill', as Levinson and Brown document (1993; see also Brown 1991: 37–40; also Brown 1983: 134–5); but one of the central uses refers to the general inclination of the territory from highland south to lowland north.

As the authors show, this inclination becomes conceptually central, so that one can use the terms 'uphill/downhill' not only with respect to the horizontal but also with respect to the vertical dimension. The use of these expressions 'to locate entitites on an idealized south/north inclined plane constitutes an absolute mode of spatial description; the terms label angles—fixed without reference to the orientation of ego or another human body and idealized away from local geography—with which one can describe relative positions' (Levinson and Brown 1993: 50).

With Tzeltal we can challenge a number of claims with respect to the universal validity of findings and insights in human conception of, and reference to, space. Thus, as Levinson and Brown also document (1990: 5–8), their Tzeltal data falsify Talmy's (1983) universals, i.e. his generalizations about how language structures space:

Contrary to Talmy's claims, in Tzeltal the Figure's geometry in spatial descriptions is more complex than the Ground's.

Contrary to Talmy's claim that only topological properties are encoded, Tzeltal encodes exact shapes, sizes and contours, fixed angles, and other locative expressions.

Contrary to Talmy's claim, Tzeltal locative descriptions do not generally equate long static figures with the paths described by point-like moving figures.

Contrary to Talmy's claim, stative dispositionals are at least as basic as pathway-descriptions, which are conceptually and linguistically distinct in Tzeltal.

(See Levinson and Brown 1990: 5–8; Levinson 1991*a*: 6; Brown 1991: 29–30, 57, 61–2). The authors concede that 'Talmy's generalizations hold well for "Standard Average European" ' but point out that

they fail to describe the Mayan case because there spatial description follows a fundamentally different strategy...In Mayan (certainly Tzeltal), the strategy is to provide a rich characterization of the Figure, from which its location, and thus its disposition with regard to the Ground, can be inferred (Levinson and Brown 1990: 18–19).

As already indicated, Levinson and Brown (1990: 28) also find that there is no left/right and only a rather weak front/back coordinate in Tzeltal,[12] and

[12] This absence of the left/right dimension, the impossibility of distinguishing verbally between two sides of an object, has far-reaching consequences: As Brown (1990: 34) reports, Tzeltal speakers playing a photograph description test-game 'failed to verbally distinguish objects displayed as "mirror images" '. Thus there is a gap in Tzeltal spatial concepts, and Brown (1990: 35) notes: 'The most fascinating evidence that there is such a gap was informants' complete bewilderment when faced with the request to distinguish verbally two configurations that to them looked identical.' See also Levinson (1991*b*: 19), Brown (1991: 35, 59 ff.), and Levinson and Brown (1994).

infer that this finding implies the weakness, if not the absence, of deictically established angles. This weakness or absence of deictically established angles is compensated by resorting to a system of absolute angles which are not ego-centrically determined but fixed by the terrain. Although there is a system of deictic expressions in Tzeltal (see Brown 1991: 7–9; 1994), the authors show that deictic expressions have sociocentric rather than purely egocentric relata; moreover, the usage is suppressed because it does not agree with the require-ments of the Tzeltal 'polite style' of speech (for the details I refer the reader to this provoking paper; see also Brown 1991: 7–9, 35, 57, 61–3; 1994). With this Mayan language we also find a number of body-part metaphors and 're-lational nouns' (Dürr 1990: 8–9) that are used to describe and to refer to parts of things. However, as the authors show, these body-part metaphors character-ize objects in and of themselves and not regions around them; moreover, the frequently used relational terms cannot be used in references to the human body. Thus, Levinson and Brown (1990: 28) infer that with respect to the body-part metaphors 'the anthropomorphism is detached from almost all vestiges of egocentricity'. Tzeltal clearly avoids egocentric descriptions in spatial refer-ence (see also Levinson 1994*b*).

With Tzotzil, the closest Mayan neighbour to Tzeltal, Lourdes de León (1991: 2–3) found a system in between an 'absolute' and an 'ego-centered' sys-tem, 'a "mixed" system of deictic and non-deictic resources which intersect with stasis and motion'. This system uses:

body-part terms as locatives (see also Mac Laury 1989); the body part terms are assigned to objects intrinsically—not projectively in relation to the observer;
'geographic locations, landmarks and the coordinate...up/down, East/West' that 'provide an anchor based on a system of absolute coordinates for locat-ive descriptions'; and
an 'ego-centric coordinate' that is encoded in demonstratives and in the deictic directionals *tal* (towards 'here') and *ech'el* (away from 'here') that are 'gener-ally associated with motion events' (de León 1991: 2).

De León's research on first-language acquisition processes of locatives in this Mayan language clearly reveals that, for Tzotzil speakers of Nabenchauk, space is socially conceptualized. As de León (1991: 19; 1994: 858–63) shows, the Tzotzil speakers of Nabenchauk 'use the "absolute" coordinates *'olon* (downward, west) and *ak'ol* (upward, east) or their corresponding motion dir-ectionals: *yalel* (going downwards) and *muyel* (going upwards)' as a locative strategy besides the use of body parts, directionals, and positionals. The east/west coordinate 'roughly overlaps with the inclined topography of the region, for this reason E(ast) corresponds to the Highlands and W(est) to the Lowlands'. However, the terms for 'upward' (*ak'ol*) and 'downward' (*'olon*) may also be used instead of the names of two towns (Jobel (San Cristobal) and

Tuxta (Tuxtla Gutierrez)). Besides the central east/west coordinate and names of towns other salient geographical locations, such as mountains, roads, and houses, provide a set of fixed landmarks for orientation. Referring to this set, de León concludes that her informants 'navigate with a local map anchored through the absolute coordinate *olon/ak'ol* and a constellation of local landmarks'.[13] She points out that this 'geo-centered system of location and orientation is acquired through the social acquisition of Tzotzil. The geo-centered system . . . maps terms into locations of a socially shared map which is socially acquired' (de León 1991: 27; 1994: 880).

All the findings of Brown and Levinson with respect to Tzeltal, but also de León's (1990) and Haviland's (1990) research on Tzotzil (see also Haviland and Levinson 1994), as well as Dürr's (1990) research on colonial Quiche show that the data from Mayan languages disagree with the general and generalized view that spatial conception is egocentric, and organized according to the coordinate system with its three reference planes which our body provides us with.

In what follows we will see that in some Papuan and Austronesian languages, as in some Mayan languages, the existence of grammaticalized terms like 'uphill' and 'downhill' also points to the 'ability for culture and geography to determine what can be linguistically significant' (Bowden 1991: 131).

1.3.3. Austronesian and Papuan languages (earlier work)

Bowden (1991) examines the grammaticalization processes which led to the development of locative expressions (in, on, behind, etc.) in more than 100 Oceanic languages (for a comparison of Bowden's data with data from African languages, see Heine 1991). Bowden shows that expressions used to describe spatial relationships derive almost exclusively from body-part nouns or from nouns referring to environmental landmarks such as 'earth' and 'sky' (Bowden 1991: p.v). He emphasizes at the very beginning of his study that 'locative concepts usually encoded formally by prepositions in English, will not normally find their semantic counterparts in the languages of other parts of the world' (p. 4). This observation is nothing new: Wilhelm von Humboldt (1822: 51–2) notes:

Man kann daher mit Recht bezweifeln . . . dass es ursprünglich Praepositionen . . . im wahren Sinne des Wortes gegeben habe. Alle haben vermuthlich, nach Horne Took's [!] richtiger Theorie, ihren Ursprung in wirklichen, Gegenständen [!] bezeichnenden Wörtern.

And Bowden refers to Ray, who notes in his description of the Baki language that 'some words used as prepositions and adverbs are probably nouns' (Ray 1926: 255); with respect to compound prepositions in To 'aba 'ita, Ray (p. 511)

---

[13] For a purely anthropological study of 'maps' of movement in connection with his research on the Ongee hunters and gatherers of Little Andaman, see Pandya (1990), who concludes that, for the Ongees, 'movement alone defines and constructs space' (p. 793).

observes that they 'consist of local nouns preceded by the locative preposi-
tions'. A number of grammars of Oceanic languages do indeed tend to avoid
the term 'preposition', but—as Bowden (1991: 5) also mentions—'there is no
real consensus on which labels should be applied'. However, as a general
finding we may note that in Oceanic languages many locatives—to use prob-
ably the most neutral term to describe a functional category[14]—share some
characteristics with nouns, especially with nouns that refer to the human body
or to body parts. This is no surprise, either, because our body and 'the relation-
ships between different parts of the body, have an important role to play in the
way people understand a talk about spatial relationships' (Bowden 1991: 6).
Thus we find the adoption of a concept like 'face' to express the locative con-
cept 'front'—and this is indeed similar to what happened with the English item
front, too: it has its origin in Latin *frons* 'forehead' (see e.g. Svorou 1986: 523;
Hill 1978: 533; Vater 1991: 44). These concepts undergo a process of 'gram-
maticalization' (Meillet 1912; Kurylowicz 1965; see Bowden 1991: 13–16)
that changes their status from initially being members of open grammatical
categories—with less grammatical status—into members of closed-class categ-
ories with more grammatical status. With the systems of locatives in Oceanic
languages we find not only the body but also, for example, the house as a cen-
tre (see Bowden 1991: 104–6), and this is another good example to prove that
'although there might be some very strong principles of cognitive salience
which lead to the predominance of the human body as a reference point, lan-
guages do leave room for culturally determined principles of selection to work
alongside them' (Bowden 1991: 107; see also Brown 1983: 146). Moreover, we
also find locatives that express the metalinguistic concepts 'sea' and 'land' that
seem 'to have been culturally and geographically determined' (Bowden 1991:
107). In connection with these findings, Bowden emphasizes the following
(p. 109):

In Oceania, SEA and LAND are the most striking examples of non-universal locative
adpositions, but in other geographic or cultural environments there are other locatives
which can also serve crucially important functions. One of the best known examples is
the use of grammaticalised forms for 'up-river', 'up-valley', and 'down-river', 'down-
valley' in some languages. Such adpositions are usually found in the languages of
people who live in the valleys of interior regions, such as the languages of many people
who inhabit the highlands of Papua New Guinea . . . Although a core set of locative
concepts is destined for grammaticalisation in all languages, particular languages can
leave slots for other grammaticalised markers of location, as long as those locations are
particularly important to their speakers.

In her study of Tolai, an Austronesian language of Papua New Guinea,
Mosel (1982: 112) emphasizes that 'the Tolai system of deictics is bound to the

---

[14] See Bowden (1991: 8): 'I will use "locative" as a description of a functional category.
Anything that is used to mark a locative relation, whether it is a noun, adverb, preposition, affix or
anything else will be called a "locative".'

natural environment of the Tolai people'. Tolai local deictics do not only distinguish between 'here' and 'there', but are also marked for:

1. the level at which the indicated place is located relative to the speaker's position...
2. whether the indicated place is:
    (a) a place at which an action takes place . . .
    (b) a place where something or somebody is found . . .
    (c) the goal of an action . . .
    (d) the source of an action . . .
3. Whether or not the place pointed at is known to the hearer. (Mosel 1982: 111.)

In her minute analysis of local deixis in Tolai, Mosel (pp. 119–21) shows that we first have to distinguish two classes of deictics, deictics indicating the speaker's position and deictics indicating some place which is not the speaker's position. The second class of deictics can be subclassified into fifteen hierarchically ordered subclasses, which express concepts like '+/– remote (with respect to 1st, 2nd and 3rd person), +/– action, location, goal, source'. Thus we find a rather sophisticated system of local deictics that 'consists of various hierarchically ordered subclasses which show different degrees of complexity' (Mosel 1982: 129; for an overview on spatial reference systems in languages of Oceania with excellent literature for further investigation, see Barnes 1993).

Heeschen (1982) starts his analysis of some systems of spatial deixis in Papuan languages with the following two general statements:

First, 'anthropological and linguistic studies of small, illiterate communities sometimes suggest that space is of much more importance in ordering experience than it is in the speech communities of Western civilisation' (p. 82).[15] Thus we find that

in some Papuan languages reference to space and direction . . . and to the relative position of the referent to the speaker or hearer, is built into the verbal morphology . . . that, in narrative texts, the spatial as opposed to the temporal axis is predominant in non-literature cultures . . . (and that) movements in space are in themselves significant; they are plans of action . . .

Second,

an inspection of . . . Papuan languages . . . suggests a distinction between two systems of spatial deixis: (a) those which have an unspecified *here*, but which do specify the generalized *there* known from most European languages, and (b) those which also specify the *here* . . . The following features can be added to the notion of 'there': spatial direction (up, across, seawards, mountainwards), relative proximity to speaker and/or hearer, visible to speaker and/or hearer, present or not, previously mentioned in discourse. Where the generalized *here* of European languages is specified as well, we find

---

[15] This observation comes close to Denny's hypothesis quoted above (Denny 1978: 80); note that Heeschen himself refers to Denny in this context. See also n. 5 above.

the same features as those realized in the system of *there* . . . . . . *here* never exhibits a greater number of features than *there* . . . (p. 83.)

On the basis of these two general insights, Heeschen analyses the systems of local deixis in the Eipo, Yale, and Angguruk languages of Irian Jaya (for the details I refer the reader to Heeschen's interesting paper). Especially with respect to the Eipo and Yale systems Heeschen (1982: 96) realizes that

speakers constantly point in the direction of things meant. The deictics are mere stand-ins . . . for real place names, and their use presupposes a common knowledge of what events are likely to happen at what places . . . More than in our societies does the use of deictics presume a shared geographical and cultural context.

With these systems that reflect the speaker's concrete environment to a high degree, speakers get into difficulties if problems of identification and co-ordination arise between speaker's 'here' and hearer's 'there' (Heeschen 1982: 96–9). However, whenever these problems arise, the 'languages fall back on the intrinsic systems of reference' (p. 106).[16]

Teljeur (1987) analysed spatial orientation among the Giman of South Halmahera in the Moluccas (Indonesia). Giman (also Gane) is an Austronesian language the orientation system of which is not 'neutral' from a cultural point of view, 'but functions in "placing" basic concepts of a culture together in a more or less coherent symbolic system' (Teljeur 1987: 348). The Giman system of orientation is dependent on the local landscape, as Teljeur points out; however, it can be used to refer to the whole known world. The system 'is composed of three more or less discontinuous levels or rather scales localizing a person or an object (1) in a house within a very short distance, (2) in a village, or (3) in the world. Change of scale is often indicated by a change of spatial categories' (p. 348). Teljeur found that the Giman system differentiates the following six spatial categories, 'sea, land, up, down, yonder' and 'here'. He emphasizes that the exact meaning of these categories can only be established in their local context, and provides the reader with illustrative examples. Teljeur documents that the Giman orientation system is purely conventional (p. 359), comparing the 'world-scale orientation' with the Pulilo 'village-scale orientation', and comparing this system with the 'home-scale orientation'. His comparison of the home scale with the Pulilo village-scale orientation results in some especially interesting findings. For the Giman, 'land'/'sea' are the dominant directions; 'up'/'down' have only vertical meaning, and 'yonder' is used instead of horizontal 'up'/'down' (see Teljeur 1987: 351–3). Although

---

[16] In connection with the problem that arises if two referents in the same referential area must be identified by means of 'up/down', and 'across'—speakers of Eipo and Yale solve this problem by falling back on the intrinsic system—Heeschen notes that 'from the Papuan perspective', he finds it 'rather tantalizing that European systems like here/there are based solely on the feature of relative proximity' (Heeschen 1982: 98–100).

Teljeur states that in Halmahera 'cardinal points are even virtually absent', that 'persons and objects are localized with terms that bear no relation at all with our north, south, east and west' (Teljeur 1987: 348), he concedes that the 'majority of the Giman' posess 'some knowledge of the compass points through navigation and through Muslim orientation, all Giman being Muslim believers' (p. 361). Thus, to recite the Muslim prayer in the prescribed direction, to build the niche in the back wall of the mosque so that it faces Mecca, and to orient the rectangular grave in the prescribed direction, it is necessary to know about compass points, for otherwise the Giman could not define the meaning of the respective terms used to refer to these orientations. Moreover, there are certain taboos that have to be observed with respect to the spatial orientation of cooking-places and banquets. The term most important here is *kiblat*, and Teljeur (pp. 361–3) gives a comprehensive analysis of its usage. After his discussion of the Giman system of orientation from the point of view of its cultural aspects, Teljeur provides us with a linguistic survey of the Giman orientation terminology. Again, I must refer the interested reader to Teljeur's paper for the details.

Teljeur's work serves well to emphasize that the analysis of space concepts and spatial reference in various cultures and languages must consider not only the linguistic context of an utterance but also the paramount cultural context in which such an utterance is produced and adequately understood. In his analysis of 'Demonstratives in the Blagar Language of Dolap', Steinhauer (1991) demonstrates how linguistics can meet these admittedly high standards of a sound and satisfying description of such a reference system. Contributions like these mentioned in this section of the paper clearly reveal that meaning is manifested in usage only.

1.4 CONCLUSIONS SO FAR

If we now compare our knowledge about space and verbal spatial reference which is based on research in Indo-European languages and which most of us thought (or think) to be of universal status with the data and findings documented in the research on this topic in some Australian Aboriginal, Austronesian, Papuan, and some Mayan languages, we must give up almost all our notions of universals with respect to space and spatial reference (see Levinson, forthcoming; also Senft 1994; 1995*a*). Moreover, a closer inspection of the literature reveals that Zola-Morgan and Kritchevsky (1988: 420) are right in stating that 'there is not yet a comprehensive theory of spatial cognition'. We certainly do know much about the topic in many languages, but to reach a description and analysis of the semantics of space and spatial reference, we must know much more about this topic—and our knowledge must be based on research in many more languages! I assume that one of the prerequisites for

further studies, in non-Indo-European languages and in Indo-European languages, is not only to consider the 'basic meanings' of spatial expressions—more or less neglecting their realization in context—but also to put more emphasis on the context in which spatial expressions are used in speech. Meaning is only manifested in usage; our linguistic description of the semantics of expressions is a distillation of something like a 'basic' meaning of a given expression from observations of its use. What I would like to propose here is that this problem should be tackled starting from the 'meaning in context' side, in an effort to reach the 'basic meaning' end—thus reversing the order of research strategies that (to my mind) have so far dominated most of the studies in this field. I have proposed such an approach in my attempt to describe the semantics of classifiers in Kilivila, the language of the Trobriand Islanders (Senft 1991; 1996). Such an attempt to place stress 'on real life utterances . . . on dialogues and . . . conversational exchanges', as Heeschen (1982: 107) demanded with regard to the European system of local deixis, will also consider the fact that 'reference is a collaborative task' (de León 1990: 13)—another aspect that so far has been neglected in most studies on verbal reference in general.

Ebert (1985), in her review of Weissenborn's and Klein's (1982) anthology *Here and There: Crosslinguistic Studies on Deixis and Demonstration*, concludes that the group of researchers dealing with deixis can be compared to hunter-gatherers. I think she is still right—with respect to all of us doing research in the field of verbal reference to space.

1.5. THE PAPERS IN THIS BOOK: HUNTING AND GATHERING INFORMATION ON SPATIAL REFERENCE IN AUSTRONESIAN AND PAPUAN LANGUAGES

Up until now information on spatial reference in Austronesian and Papuan languages has been extremely difficult to obtain. It is scattered over a number of scientific journals or hidden in grammars, ethnographies, or other books in anthropology and linguistics. This anthology presents, as far as I know, the first collection of papers on this topic in Austronesian and Papuan languages. Given the vast number of these languages, this anthology inevitably has to face the possible criticism of an arbitrary and eclectic selection of papers. As the editor of this volume I concede that this is so. However, the attentive reader of these papers will realize that, although the topics of the articles presented here are quite different and the languages dealt with are spread geographically between Madagascar and Tonga, the problems emerging and the questions raised in the individual papers are strikingly similar, no matter whether the respective paper is broad and general or quite specific.

The anthology can be subdivided in three parts, which I will describe below.

1.5.1. Overviews on conceptions of space in Austronesian languages

In his diachronically oriented survey article 'Semantic Change and the Conceptualization of Spatial Relationships in Austronesian Languages', Robert Blust differentiates between notions like 'inside, outside, above, below'—which he defines as representing systems of location or as 'systems of micro-orientation'—and directional systems of languages—which he calls 'macro-orientation'. He points out that the system of macro-orientation which is attributable to Proto-Malayo-Polynesian makes reference to two basic orienting features: a land–sea axis, which is highly localized, and the south-east Asian monsoons, that represent an axis with a broader geographical basis. Unlike the Indo-European system of macro-orientation, which is (in general) entirely land-based, the Austronesian system represents a system of macro-orientation that is adapted to a life on or near the sea. Outlining the reconstructed system of Proto-Malayo-Polynesian location terms and dealing with the topic of cardinality and the space–time axis, Blust discusses aspects of semantic change in Austronesian languages on the basis of the reconstructed system, and compares various Austronesian languages with respect to the verbally expressed conceptualizations of space with one another and with Indo-European languages. He demonstrates that there are fundamental conceptual differences between languages, even at the level of micro-orientation, that owe their character to the influence of the local physical environment. He also points out that some of these differences depend on whether languages are syntactically actor-oriented (like Indo-European languages) or non-actor-oriented (a feature typical of Austronesian languages). Blust concludes:

the conceptualization of spatial relationships in language is largely a product of culture acting upon experience. Experience is shaped by the physical (and cultural) environment, some parts of which are available to all . . ., while others are available only to those who inhabit particular environmental niches.

In 'An Exploration of Directional Systems in West Indonesia and Madagascar' Alexander Adelaar describes the nature and origins of various directional systems—to which Blust refers as systems of macro-orientation—in West Indonesia, the Chamic area, and Madagascar. The Madurese, Balinese, Lombok, (standard) Malay, Achehnese, Malagasy, Central, East, and West Javanese, as well as the Chamic directional systems, are described and discussed with respect to their development. They represent systems for societies with access to the sea. Directional systems in land-locked areas are represented by the Batak and the Borneo systems. In a number of societies, the cardinal (or near-cardinal) directional system also became the basic principle for an individual's orientation in space and provided a model for cosmological ordering. Adelaar briefly describes this for the Balinese, Malagasy, and Javanese cases, illustrating the function of directionals in these societies and the impact these spatial systems have for these peoples' life and culture. Like Blust, Adelaar

emphasizes that the 'towards the sea'/'towards the interior' axis is the most fundamental directional axis in Austronesian societies. Moreover, he illustrates that the adoption of cardinal systems happened primarily in speech communities whose members lived close to the sea and practised navigation. As for Java and for the Malay-speaking area, the role of cardinal directions in Hindu and Buddhist religion may also have stimulated the development of cardinal directional systems. Adelaar also illustrates that the terminology, if not the concept, of a cardinal system is often borrowed. This paper clearly shows how research on the lexical semantics of directional terms profits not only from knowledge of the physical environment in which the speakers of the languages in focus live, but also from using methods, insights, and information of disciplines like historical linguistics and the history of cultures.

Ozanne-Rivierre presents in 'Spatial References in New Caledonian Languages' descriptive sketches of systems of orientation and spatial reference, putting the emphasis on sets of non-deictic and deictic directionals and on locatives. She points out that in many Oceanic languages systems of orientation consist of a combination of geographical/topographical reference points such as sea/land, up-river/down-river, or the direction of prevailing winds on the one hand and reference points centring on ego on the other. It is interesting to note that we find in many New Caledonian languages systems of spatial reference that are quite similar to systems that can be found in some Mayan languages. As already mentioned above, these systems differentiate between an up/down axis on the one hand and an across-axis on the other hand. Ozanne-Rivierre emphasizes that the use of spatial reference terms in New Caledonian languages is highly context-dependent. In certain contexts of speech, social factors may transcend geographical space. Thus, properly to understand spatial reference terms (in many Oceanic languages) requires that the hearer be able to set these terms accurately in their context of utterance. Ozanne-Rivierre therefore concludes that the use of locatives, deictics, directional markers, etc., not only is dependent on the given material situation but can also be a function 'of a social context of which space is an essential component'.

1.5.2. Interdisciplinary approaches

The first three papers of the anthology mention (almost) all the relevant coordinate systems found and employed for spatial reference and so set the scene for the following seven papers, which describe directionals and locatives in five Austronesian and two Papuan languages. While the first three papers of the anthology are primarily written from the linguistic point of view, the following seven papers take especially Adelaar's, but also Ozanne-Rivierre's, statements with respect to the necessary inclusion of cultural information in research on spatial reference seriously. These papers present interdisciplinary, especially

anthropological linguistic, approaches to the question of how the individual languages under discussion refer to space.

In 'Finding Your Way in Longgu: Geographical Reference in a Solomon Islands Language', Deborah Hill provides a detailed example of how a spatial system based on geographical reference-points is used. Her paper demonstrates that a close description of the use of this system adds to our knowledge of the discourse functions and the cultural import of such a system. Moreover, in her description of the Longgu system Hill shows that it can be used both on small and large scales on the vertical as well as on the horizontal axis. The Longgu system has a sea–inland and a sunrise–sunset axis. It is interesting to see the differences between these two directional axes, and to realize that these differences are reflected in the use of the directional terms within the language. Hill emphasizes that the use of a system based on geographical reference-points requires, and depends on, not only knowledge of the environment in which this language is spoken but also knowledge of people's daily routines. However, there are other linguistic means for spatial reference in this Austronesian language, namely prepositions, local nouns, terms for left and right, and particles indicating direction towards and away from the speaker. These systems do not take their points of reference from the environment but depend on a human (or animal) body as their point of reference. Hill describes these means as competing systems of spatial reference within Longgu. However, she also points out that the geographical reference system has the widest range of use of these competing systems in Longgu. This study is another proof of the fact that linguistic analyses of spatial systems and their usage also require anthropological insights into the speech community under study.

Contrary to Longgu (and contrary to most of the languages mentioned in this volume), Kwaio, another Solomon Islands language, has a fairly simple and reduced orientational system. In 'Constructing Space in Kwaio', Roger Keesing describes the linguistic means this language offers to its speakers for spatial reference. In his description Keesing mentions locative particles, demonstratives, deictics, directionals, locative nouns, and prepositional verbs. He also points out the extensive development of vertical axes in Kwaio ritual and cosmology, and emphasizes the role of this vertical scheme that—in a conventionalized way—represents directions of movements along the Malaita coast. Moreover, Keesing also briefly mentions body-part terms that are used to characterize spatial relationships (a means of spatial reference which was discussed at the end of section 1.3 above, in connection with Bowden's (1991) comparative research on Oceanic languages). Although the Kwaio sometimes distinguish between east and west, they are quite unconcerned with cardinal points and other absolute directional grids such as landward/seaward or windward/leeward; the contrast between 'bush' and 'sea'—which is so important in Longgu—is only used by Kwaio speakers to distinguish between people from the interior and people from the coastal strand. Kwaio also has terms for

'left' and 'right', but this polarity is not as emphasized cosmologically as in many other Austronesian cultural traditions. It is important for Keesing to point out that 'systems of linguistically-constructed spatial orientation' that differ from systems we find in Western languages may 'coexist, as alternative schemata, with orientational systems much more closely akin to those of Western languages'. He therefore ends his paper with the same warning with which he (in an anecdote) started: the (comparative) study of spatial conceptualizations must avoid seeking only exotic and complex modes for encoding spatial relationships. Languages that construct these relationships in what we—from an Indo-European point of view—may often call 'exotic' ways are important to challenge our 'takens-for-granted'. However, we should not forget to research other, less exotic and elaborated systems of spatial reference in other languages. Otherwise we may overlook or even ignore further important constraints, and perhaps even universals in the human conceptualizations of space.

That this danger of overlooking or ignoring important constraints is immanent in studying spatial reference and conceptions of space from the linguistic point of view (only) is convincingly demonstrated in Jürg Wassmann's paper 'Finding the Right Path: The Route Knowledge of the Yupno of Papua New Guinea'. Wassmann studies route knowledge as a special kind of spatial knowledge in the Yupno speech community, whose Papuan language is classified as belonging to the 'Yupna family' of the 'Finisterre-Huon Stock'. He poses a general problem that is universally valid for all studies on the externalizations of inner mental images of our spatial environment: how is the route knowledge of the Yupno 'represented in different kinds of externalizations and...to what degree are these similar or different'? Wassmann points out that the verbal representation of route descriptions is only one form of these externalizations. There are at least two other types: the motoric representation, which provides information on how people behave en route, and the graphic representation, which tells us how people draw routes. Traditionally, these three types of externalization have been investigated separately by linguistics, anthropology, and psychology. Wassmann approaches the problem from the anthropological, linguistic, and psychological point of view. Discussing his findings on the route knowledge of the Yupno he emphasizes that actual, and appropriate, behaviour in space is very much dependent on the culture in which a person lives and moves. Aspects of route knowledge that are verbally externalized need not necessarily be acquired verbally: here 'the action' can be more important than 'the word'. Like Keesing, Wassmann points out that, although the language may offer a broad variety of verbal means for spatial reference, speakers may be very selective in their actual use of these means in their speech production. Moreover, his results show that different externalizations of spatial knowledge (may) represent different things: although his consultants' verbal route descriptions were all similar, their route drawings were

not; however, the drawings contained more information than the verbal descriptions. It may well be the case that these 'differences are a consequence of the medium, that—depending on whether people talk or draw—different partial aspects of the mental model are activated in preference to others'. This has, of course, some important consequences for the general discussion in the cognitive sciences on the problem of how knowledge is stored in the brain. However, Wassmann's study as a whole also emphasizes the following: It goes without saying that studying spatial reference in different languages and cultures demands a sound linguistic description of the verbal means these languages offer. However, studying conceptions of space and spatial reference inevitably requires interdisciplinary approaches as soon as we want to leave this linguistic—descriptive—level to draw more general inferences on cultural and cognitive implications of the spatial systems studied.

In 'Relativities: Use and Non-use of Spatial Reference among the Yale Speakers in Irian Jaya (West New Guinea)', Volker Heeschen argues along similar lines. Heeschen describes the grammar of the spatial deictic system of this Papuan language, which is a member of the Mek language family. He illustrates stylistic variants in the use of these deictics, and discusses some of the speakers' preferences for these variants in actual speech situations. He starts with the observation that the Yale deictics, relying heavily on accompanying pointing gestures, 'are mere stand-ins for real place names'; thus, 'their use presupposes a common knowledge of what events are likely to happen at what places'. Heeschen argues that demonstratives and articles developed from a set of simple spatial deictics in Yale. Together with a network of landmarks and place-names, a set of directional verbs, and local adverbs, they constitute the Yale system of verbal means for spatial reference. Moreover, he observes that reference to actors in stories—especially in myths and tales—is closely linked to lines of place names and to activities and events that can easily be associated with them. The left/right opposition does not play a role for the Yale. It is the high/low and centre/periphery distinction that underlie the deictics, the directional verbs, and the local adverbs. Heeschen argues that this observation can be interpreted as follows: The high/low distinction is so important for the Yale speakers because 'man cannot hold his ground against the towering mountains and steep valleys...his personal space is narrowed down by this environment confining man's mobility'. The centre/periphery distinction reflects 'man's deep-rooted need to be home somewhere'. With these lines of argument Heeschen introduces human ethological concepts into the interdisciplinary approach towards the description of conceptions of space and means of spatial reference. On the basis of his data Heeschen also claims that there is a clear distribution of strategies and means for spatial reference in various Yale speech genres. A closer look at these genres with respect to the use and non-use of spatial reference shows, so Heeschen states, that linguistic 'relativity... consists in the relativities of styles and uses, in the reflexivity of codes and cultural

canons and in the characteristics of an environment which all subsystems of spatial reference have to depict'.

In his description of the 'Spatial Deixis in Muna', an Austronesian-Celebic language of Sulawesi, René Van den Berg comes to a similar conclusion. The Muna deictic system is classified as a system with distance, height (including cardinality), and visibility as its three dimensions of contrast. This paper does not only give illustrative data on seven sets of demonstratives in Muna, with a description of what factors govern the speaker's choice of a given set. Van den Berg also describes the Muna system of simple and complex prepositions, the means to refer to position and location, the use of cardinal direction terms with extremely interesting subdialectal variations, and the expressions speakers use in referring to their moving up and/or down from one location to another. The paper illustrates that speakers of Muna have many choices with respect to what kind of system they want to use for verbally referring to locations and to objects or configurations in space. Moreover, it also shows that the appropriate use of Muna spatial reference terms in certain contexts does not only ask for the speaker's adequate perception and classification of the situative context, but also requires the speaker's knowledge of both geographical and cultural facts.

Geographical as well as social and historical knowledge is also important for the understanding of locatives and directionals in Aralle-Tabulahan, a West Austronesian language spoken in South Sulawesi. In 'Downstream to Here: Geographically Determined Spatial Deictics in Aralle-Tabulahan', Robin McKenzie outlines the spatial deictic system of this language with particular emphasis on its geographically determined forms. In most cases the usage of the six locatives and directionals in Aralle-Tabulahan relate to geographical contour (with expressions equivalent to what we gloss as 'up(wards), down(wards), level(wards)'), and to river(s) (with expressions equivalent to what we gloss as 'upstream/in(wards), downstream out(wards), across(wards)'). After a description of the grammatical usage and meaning of these terms, McKenzie also discusses how the system (of directionals) is used for spatial reference when more than one geographical factor could apply, either sequentially or concurrently. If more than one geographical factor is operative concurrently, forms that refer to the 'river(s)' seem to take precedence over forms referring to geographical 'contour'. If several geographical factors are to be considered in sequence for the choice of a directional, 'the factor representing the final stage of a journey', for example, 'is the relevant one for choosing an appropriate directional'. McKenzie calls this 'the principle of the ultimate factor', and points out that this principle holds especially for references to short-range travel sequences. However, if a speaker's perception of a route takes into account the relative positions of his starting-point and his destination, 'the principle of relative position' holds, especially for references over longer distances. This principle only takes account of the relative positions of start and goal, and

thus relates to the overall geographical contour of the environment. However, McKenzie also shows that speakers of Aralle-Tabulahan will in certain contexts also select locatives and directionals that run counter to geographical considerations. He demonstrates that in these cases social and/or historical factors influence a speaker's choice and usage of locatives and directionals in Aralle-Tabulahan.

Directionals are also the focus of John Bowden's paper, 'The Meanings of Directionals in Taba (Makiam Dalam)', concerning an Austronesian language spoken chiefly on Makian, Moti, and Kayoa islands in the North Maluku region of Indonesia. The class of directionals is pre-eminent amongst the strategies offered by the set of linguistic resources of Taba to its speakers for spatial reference. Bowden isolates five directional roots in Taba, which can be glossed as 'up, down, sea(wards), land(wards)', and 'there'. To these roots affixes can be attached to indicate motion towards or from a particular direction and static location in a direction. Moreover, these roots can also be nominalized, and then indicate parts of objects that are oriented in a particular direction. Like Giman (see 1.3), Taba is not only an Austronesian language spoken in the North Maluku region, but also has a directional system that—like the Giman system—operates over three partially overlapping levels. For Taba the three relevant scales are: 'within a house or within a neighbourhood', 'on and nearby Makian island', and 'in the wider world'. Uncovering the meanings of Taba directionals as they are expressed at each of these three scalar levels, Bowden points out the following. At first sight, the meanings of the terms at each of these three levels appear to be quite different and even arbitrary. However, understanding the cultural milieu of the Makianese, i.e. a good knowledge of the Taba speakers' culture and society, and some information on the regional history, lead to an understanding of the clear connections between the meanings of the Taba directionals at each of the three levels.

1.5.3. Structural linguistic approaches

After all these interdisciplinary papers, we return to the more linguistic aspect of our research topic in the third part of this volume with its three contributions on one Papuan and one Austronesian language. It goes without saying that the basis for every good description of how speakers of various languages refer to space is—and always will be—the sound and adequate linguistic description of the linguistic phenomena.

In 'Conceptualization of Space in Nimboran', Hein Steinhauer describes the spatial differentiation apparent in the verbal morphology of Nimboran. Nimboran is a Papuan language of the Trans-New Guinea Phylum that is spoken in the Jayapura district west of Lake Sentani. Steinhauer's paper—'an appraisal and rephrasal' of some of the data gathered by J. C. Anceaux—presents a brief survey of the complete system of verbal categories, then

discusses formal aspects that are relevant for the expression of spatial categories, and finally presents an analytic account of these categories. Steinhauer clearly works out and emphasizes the deictic aspect of Nimboran verbal semantics.

In his 'Supplementary Remarks' to Steinhauer's paper, Bert Voorhoeve makes a few additional notes on the positional categories in Nimboran that are based on Steinhauer's feature analysis and his discussion of apophony. Voorhoeve describes and explains why we do not find the theoretically possible twenty, but only eleven morphologically marked movements between the five points 'here', 'there', 'above', 'below', and 'far away' in this language. Moreover, on the basis of observation that the forms *bá* (above) and *ná* (far away) never appear as starting-points of a movement, Voorhoeve hypothesizes that this may reflect the Nimboran speakers' world-view 'according to which their homeland is situated at the bottom of an enormous hollow sphere and where "very far away" is equated with "at the top of the world" '—a world-view attested so far only for the Asmat people.

In connection with Steinhauer's and Voorhoeve's discussion of Anceaux's data I would like to make the following comment. Voorhoeve finishes his remarks with an extremely interesting hypothesis for anthropologists and anthropological linguists with respect to the Nimboran speakers' world-view. Steinhauer's presentation and reanalysis of Anceaux's unusual data ends with a number of open questions. This fact, certainly also a product of working with someone else's data, clearly indicates how truly under-studied most Papuan languages and cultures are and how necessary it is to do further research on these languages and cultures before they die. As we all know, for various reasons most of the Papuan languages and cultures have to be classified as being endangered.

It should now be clear that the means to refer verbally to space are manifold indeed. So far we have seen that answers to the question of how Austronesian and Papuan languages refer to space demand much more basic research in these languages, and that understanding the verbally expressed spatial conceptions in general requires interdisciplinary approaches. However, it seems that even within the framework of 'purely' linguistic descriptions the study of various means of spatial reference still offers a number of astonishing, if not provoking, insights that ask for rather unusual analyses of these means for verbal reference to space.

In 'Locative Classifiers in Tongan' Jürgen Broschart discusses a peculiar class of words in Tongan grammar which are semantically cognate with Indo-European local nouns or adverbs, but whose grammatical function in certain constructions can best be described as locative classification. On the basis of purely structural, grammatical considerations, Broschart makes the interesting (and convincing, though quite provoking) proposal that these 'words' should be referred to as 'locative classifiers'. The locative classifiers of Tongan

thus represent a special subset of the grammatical paradigm of classifiers, along with numeral classifiers and relics of possessive or relational classifiers.

1.5.4. Concluding remarks

Languages offer their speakers many means by which to refer to space. The aim of this anthology is to illustrate what kind of means speakers of Austronesian and Papuan languages employ for this task. This is so far a rather underdeveloped research topic, and therefore this book aims to contribute to our understanding of this area. Although the papers clearly show how different are the various systems for spatial reference found in the languages under discussion—especially in comparison with Indo-European languages, but also in comparison with each other—many parallels emerge with respect to what kinds of coordinate systems languages and their speakers use when they are referring to space. However, to understand differences in the use of similar, if not identical, coordinate systems requires not only linguistic but also non-linguistic (especially cultural, historical, and geographical) knowledge. Only interdisciplinary, anthropological linguistic approaches allow us really to understand the basic logic of these conceptions of space manifest in verbal expressions. To illustrate the necessity of this interdisciplinary approach to the topic of 'space' is the second central aim of this collection of papers. Thus, this book is offered to its readers as a contribution to the anthropological/linguistic research on space.

Readers should decide for themselves whether this anthology meets its aims. Following the title of this volume, I am now 'referring' readers to the 'space' occupied by the following papers.

REFERENCES

Andersen, Elaine S. (1978). 'Lexical Universals of Body-Part Terminology', in Joseph H. Greenberg (ed.), *Universals of Human Language* iii: *Word Structure*, 335–68. Stanford, Calif.: Stanford University Press.

Anderson, Stephen R., and Keenan, Edward L. (1985). 'Deixis', in Timothy Shopen (ed.), *Language Typology and Syntactic Description*, iii: *Grammatical Categories and the Lexicon*, 259–308. Cambridge: Cambridge University Press.

Barnes, R. H. (1993). 'Everyday Space: Some Considerations on the Representation and Use of Space in Indonesia', in Jürg Wassmann and Pierre Dasen (eds.), *Alltagswissen: der kognitive Ansatz im interdisziplinären Dialog*, 159–78. Fribourg: Universitätsverlag Fribourg.

Bartels, Ute (1991). *Topologische Präpositionen: Semantische Repräsentation und Verwendung*. Mimeo, Nijmegen.

Bavin, Edith L. (1990). 'Locative Terms and Warlpiri Acquisition', *Journal of Child Language* 17: 43–66.

Becker, Angelika, Carroll, Mary, and Kelly, Ann (eds.) (1988). *Reference to Space*. Final report, vol iv, ESF project, 'Second-Language Acquisition by Adult Immigrants'. Mimeo, Strasburg/Heidelberg.

Bellugi, Ursula (1988). 'The acquisition of a spatial language', in Frank S. Kessel (ed.), *The Development of Language and Language Researchers: Essays in Honor of Roger Brown*, 153–85. Hillsdale, NJ: Lawrence Erlbaum.

Berlin, Brent, and Kay, Paul (1969). *Basic Color Terms*. Berkeley, Calif.: University of California Press.

Bowden, John (1991). 'Behind the Preposition: Grammaticalisation of Locatives in Oceanic Languages'. MA thesis, University of Auckland.

Bowerman, Melissa (1991). 'The Origins of Children's Spatial Semantic Categories: Cognitive vs. Linguistic Determinants', paper presented at the Wenner-Gren Symposium, 'Rethinking Linguistic Relativity', 3–11 May 1991, Ocho Rios, Jamaica. Mimeo, Nijmegen.

Brown, Cecil H. (1983). 'Where Do Cardinal Direction Terms Come From?', *Anthropological Linguistics* 25: 121–61.

Brown, Penelope (1990). *Spatial Conceptualization in Tzeltal Language and Action*. Mimeo, Berlin/Nijmegen.

—— (1991). *Spatial Conceptualization in Tzeltal*. Mimeo, Nijmegen.

—— (1994). 'The INs and ONs of Tzeltal Locative Expressions: The Semantics of Static Descriptions of Location', *Linguistics* 32: 743–90.

—— and Levinson, Stephen C. (1990). ' "Uphill" and "Downhill" in Tzeltal'. Berlin, Nijmegen: Mimeo.

—— —— (1993). ' "Uphill" and "Downhill" in Tzeltal', *Journal of Linguistic Anthropology* 3: 46–74.

Bühler, Karl (1934). *Sprachtheorie: Die Darstellungsfunktion der Sprache*. Jena: Gustav Fischer. Repr. 1978, Frankfurt a.M.: Ullstein.

—— (1990). *Theory of Language: The Representational Function of Language*. Trans. Donald Fraser Goodwin. Amsterdam: John Benjamins.

Choi, Soonja, and Bowerman, Melissa (1991). 'Learning to Express Motion Events in English and Korean: The Influence of Language-Specific Lexicalization Patterns', *Cognition* 41: 83–121.

Clark, Herbert (1973). 'Space, Time, Semantics, and the Child', in Timothy E. Moore (ed.), *Cognitive Development and the Acquisition of Language*, 27–63. New York: Academic Press.

Cleve, J. van, and Frederick, R. (1991). *The Philosophy of Right and Left*. Dordrecht: Kluwer.

Denny, J. Peter (1978). 'Locating the Universals in Lexical Systems for Spatial Deixis', in *Papers from the Parasession on the Lexicon, Chicago Linguistic Society* (14–15 April, 1978), 71–84. Chicago: CLS.

—— (1985). 'Was ist universal am raumdeiktischen Lexikon?', in Harro Schweizer (ed.), *Sprache und Raum*, 111–28. Stuttgart: Metzler.

Dixon, Robert M. W. (1972). *The Dyirbal Language of North Queensland*. Cambridge: Cambridge University Press.

Dürr, Michael (1990). *Reference to Space in Colonial Quiche*. Mimeo, Göttingen.

Dutton, Tom (ed.) (1991). *Papers in Papuan Linguistics, i*. Pacific Linguistics A-73. Canberra: Australian National University.

Ebert, Karen H. (1985). 'Wo ist "da" in Papua?', *Zeitschrift für Sprachwissenschaft* 4: 259–78.

Ehrich, Veronika (1991). *Hier und Jetzt: Studien zur positionalen und temporalen Deixis im Deutschen*. Mimeo, Nijmegen/Cologne.

Evans, Nick (1991). 'Cardinal Categories in Kayardild Determiners, paper presented at the Cognitive Anthropology Research Group at the Max Planck Institute for Psycholinguistics, Nijmegen, 4 Oct. 1991.

Fillmore, Charles J. (1975). *Santa Cruz Lectures on Deixis 1971*. Bloomington: Indiana University Linguistics Club.

—— (1982). 'Towards a Descriptive Framework for Spatial Deixis' in Robert Jarvella, and Wolfgang Klein (eds.) *Speech, Place, and Action*, 31–59. Chichester: John Wiley.

Goeppert, Herma C. (1970). 'Die sprachliche Strukturierung des Raumes', Ph.D. thesis, Eberhard-Karls-Universität, Tübingen.

Gosztonyi, Alexander (1976). *Der Raum: Geschichte seiner Probleme in Philosophie und Wissenschaften*. 2 vols., Freiburg/Munich: Karl Alber.

Hanks, William F. (1987). 'Markedness and Category Interactions in the Malagasy Deictic System', *University of Chicago Working Papers in Linguistics*, 3 (Jan. 1987), 109–36.

Haugen, Einar (1957). 'The Semantics of Icelandic Orientation', *Word* 13: 447–60. Repr. 1969 in Stephen A. Tyler (ed.), *Cognitive Anthropology*, 330–42. New York: Holt, Rinehart & Winston.

Haviland, John (1979). 'Guugu Yimidhirr', in Robert M. W. Dixon and Berry J. Blake (eds.), *Handbook of Australian Languages*, i. 27–180. Amsterdam: John Benjamins.

—— (1990). *The Grammaticalization of Motion (and Time) in Tzotzil*. Mimeo, Berlin/Nijmegen.

—— (1992). *Anchoring and Iconicity in Guugu Yimidhirr Pointing Gestures*. Mimeo, Nijmegen.

—— and Levinson Stephen C. (eds.) (1994). 'Spatial Conceptualization in Mayan Linguistics', *Linguistics* 32: 613–907.

Heeschen, Volker (1982). 'Some Systems of Spatial Deixis in Papuan Languages', in Jürgen Weissenborn and Wolfgang Klein (eds.), *Here and There: Cross-linguistic Studies on Deixis and Demonstration*, 81–109. Amsterdam: John Benjamins.

Heine, Bernd (1991). *Conceptual Grammaticalization and Prediction*. Mimeo, Cologne.

Herrmann, Theo (1990). 'Vor, hinter, rechts und links: Das 6H-Modell. Psychologische Studien zum sprachlichen Lokalisieren', *Zeitschrift für Literaturwissenschaft und Linguistik* 78: 117–40.

Herskovits, Annette (1986). *Language and Spatial Cognition: An Interdisciplinary Study on the Prepositions in English*. Cambridge: Cambridge University Press.

Hill, Clifford (1978). 'Linguistic Representation of Spatial and Temporal Orientation', in *Proceedings of the Fourth Annual Meeting of the Berkeley Linguistic Society*, 524–38. Berkeley, Calif.: BLS.

—— (1982). 'Up/down, front/back, left/right: A Contrastive study of Hausa and English', in Jürgen Weissenborn and Wolfgang Klein (eds.), *Here and There: Cross-linguistic Studies on Deixis and Demonstration*, 13–43. Amsterdam: John Benjamins.

Hörmann, Hans (1978). *Meinen und Verstehen: Grundzüge einer psychologischen Semantik*. Frankfurt a.M.: Suhrkamp.

Humboldt, Wilhelm von [1822] (1963). 'Über das Entstehen der grammatischen Formen, und ihren Einfluss auf die Ideenentwicklung', in Andreas Flitner and Klaus Giel (eds.), *Wilhelm von Humboldt: Werke in fünf Bänden*, iii: *Schriften zur Sprachphilosophie*, 31–63. Stuttgart: J. G. Cotta'sche Buchhandlung.

Jandl, Ernst (1977). 'Lichtung', in Karl Otto Conrady (ed.), *Das große deutsche Gedichtbuch*, 979. Kronberg: Athenäum.

Jarvella, Robert, and Klein, Wolfgang (1982a). 'Preface', in Robert Jarvella and Wolfgang Klein (eds.), *Speech, Place, and Action*, pp. vii–viii. Chichester: John Wiley.

—— —— (1982b). 'A Brief Introduction', in Robert Jarvella and Wolfgang Klein (eds.), *Speech, Place, and Action*, 1–5. Chichester: John Wiley.

Johnston, Judith R. (1988). 'Children's Verbal Representation of Spatial Location', in Stiles-Davis et al. (1988: 195–205).

—— and Slobin, Dan I. (1979). 'The Development of Locative Expressions in English, Italian, Serbo-Croatian and Turkish', *Journal of Child Language* 6: 529–45.

Kant, Immanuel [1768] (1968). 'Von dem ersten Grunde des Unterschiedes der Gegenden im Raume', in *Kants Werke: Akademie Textausgabe*, ii: *Vorkritische Schriften II*, 1757–1777, 377–383. Berlin: Walter de Gruyter.

Klein, Wolfgang (1990). 'Überall und nirgendwo: Subjektive und objektive Momente in der Raumreferenz', *Zeitschrift für Literaturwissenschaft und Linguistik* 78: 9–42

—— (1991). 'Raumausdrücke', *Linguistische Berichte* 132: 77–114.

Kritchevsky, Mark (1988). 'The Elementary Spatial Functions of the Brain', in Stiles-Davis et al. (1988: 111–40).

Kurylowicz, Jerzy (1965). 'The Evolution of Grammatical Categories', *Diogenes* 51: 55–71.

Lee, Michael (1988). 'Language, Perception and the World', in John Hawkins (ed.), *Explaining Language Universals*, 211–46. Oxford: Blackwell.

de León, Lourdes (1990). 'Space Games in Tzotzil: Creating a Context for Spatial Reference'. Mimeo, Berlin/Nijmegen.

—— (1991). 'Unpredicted Strategies: Explorations in the Acquisition of Locatives in Tzotzil'. Mimeo, Nijmegen.

—— (1994). 'Explorations in the Acquisition of Geocentric Location by Tzotzil Children', *Linguistics* 32: 857–84.

Levelt, Willem J. M. (1986). 'Zur sprachlichen Abbildung des Raumes: Deiktische und intrinsische Perspektive', in Hans-Georg Bosshardt (ed.), *Perspektiven auf Sprache: Interdisziplinäre Beiträge zum Gedenken an Hans Hörmann*, 187–211. Berlin: Walter de Gruyter.

Levinson, Stephen C. (1983). *Pragmatics*. Cambridge: Cambridge University Press.

—— (1991a). 'Figure and Ground in Mayan Spatial Description: Tzeltal Locative Descriptions'. Mimeo, Berlin/Nijmegen.

—— (1991b). 'Relativity in Spatial Conception and Description', paper presented at the Wenner-Gren Symposium 'Rethinking Linguistic Relativity', 3–11 May 1991, Ocho Rios, Jamaica. Mimeo, Berlin/Nijmegen. (Forthcoming in John Gumperz and Stephen C. Levinson (eds.), *Rethinking Relativity*. Cambridge: Cambridge University Press).

—— (1991c). 'Primer for the Field Investigation of Spatial Description and Conception', Cognitive Anthropology Research Group, Nijmegen, Working Paper No. 5. Mimeo, Nijmegen.

Levinson, Stephen C. (1994*a*). 'Deixis', in R. E. Asher (ed.), *Encyclopedia of Language and Linguistics*, ii. 853–57. Oxford: Pergamon Press.

—— (1994*b*). 'Vision, Shape, and Linguistic Description: Tzeltal Body-Part Terminology and Object Description', *Linguistics* 32: 791–855.

—— (forthcoming). 'Frames of Reference and Molyneux's Question: Cross-Linguistic Evidence', in P. Bloom, M. Peterson, L. Nadel, and M. Garrett (eds.). *Language and Space*. Boston: MIT Press.

—— and Penelope Brown (1990). 'Recentering' in Mayan Spatial Description with Special Reference to Tzeltal'. Mimeo, Berlin/Nijmegen.

—— —— (1994). 'Immanuel Kant among the Tenejapans: Anthropology as Empirical Philosophy', *Ethos* 22: 3–41.

Lewis, David (1976). 'Observations on Route Finding and Spatial Orientation among the Aboriginal Peoples of the Western Desert Region of Central Australia', *Oceania* 46: 249–82.

Liben, Lynn S. (1988). 'Conceptual Issues in the Development of Spatial Cognition', in Stiles-Davis et al. (1988: 167–94).

Lorenz, Konrad (1977). *Die Rückseite des Spiegels: Versuch einer Naturgeschichte menschlichen Erkennens*. Munich: Deutscher Taschenbuch Verlag.

Lotterman, Johan (1992). 'Some Minor Word Classes in Tanggu', paper presented at the Third International Conference on Papuan Linguistics, Madang, 15–18 Sept. 1992.

Lyons, John (1982). 'Deixis and Subjectivity: *Loquor, ergo sum*?' in Robert Jarvella and Wolfgang Klein (eds.), *Speech, Place, and Action*, 101–24. Chichester: John Wiley.

McCormack, R. W. B. (1991). *Tief in Bayern: Eine Ethnographie*. Frankfurt a.M.: Eichborn Verlag.

Mac Laury, Robert E. (1989). 'Zapotec Body-Part Locatives: Proto-types and Metaphoric Extensions', *International Journal of American Linguistics* 55: 119–54.

Masinambow, E. K. M. (ed.), (1987). *Halmahera Dan Raja Ampat Sebagai Kesatuan Majemuk*. Studi-Studi Terhadap Suatu Daerah Transisi. *Buletin Leknas* 2(2) (1983). Terbitan Khusus. Jakarta: Lembaga Ekonomi dan Kemasyarakatan Nasional.

Meillet, Antoine [1912] (1948). 'L'évolution des formes grammaticales', in *Linguistique historique et linguistique générale*, 130–48. Paris: Klincksieck.

Miller, George A. (1982). 'Some Problems in the Theory of Demonstrative Reference', in Robert Jarvella and Wolfgang Klein (eds.), *Speech, Place, and Action*, 61–72. Chichester: John Wiley.

—— and Johnson-Laird, Philip N. (1976). *Language and Perception*. Cambridge: Belknap Press.

Mosel, Ulrike (1982). 'Local Deixis in Tolai', in Jürgen Weissenborn and Wolfgang Klein (eds.) *Here and There: Cross-linguistic Studies on Deixis and Demonstration*, 111–32. Amsterdam: John Benjamins.

Ozanne-Rivierre, Françoise (1987). 'L'Expression linguistique de l'orientation dans l'espace: Quelques exemples océaniens', *Cahiers du LACITO* 2: 129–55.

Paillard, Jacques (1991). *Brain and Space*. Oxford: Oxford University Press.

Pandya, Vishvajit (1990). 'Movement and Space: Andamanese Cartography', *American Ethnologist* 17: 775–97.

Pick, Herbert L. (1988). 'Perceptual Aspects of Spatial Cognitive Development', in Stiles-Davis et al. (1988: 145–56).

Ray, Sidney Herbert (1926). *A Comparative Study of the Melanesian Island Languages.* Cambridge: Cambridge University Press.

Robertson, Ian H., and Marshall, John C. (eds.) (1993). *Unilateral Neglect: Clinical and Experimental Studies.* Hove, Sussex: Erlbaum.

Schöne, Hermann (1984). *Spatial Orientation: The Spatial Control of Behavior in Animals and Man,* trans. Camilla Strausfeld. Princeton, NJ: Princeton University Press.

Schweizer, Harro (ed.) (1985). *Sprache und Raum.* Stuttgart: Metzler.

Senft, Gunter (1991). 'Network-Models to Describe the Kilivila Classifier System', *Oceanic Linguistics* **30**: 131–55.

—— (1994). 'Ein Vorschlag, wie man standardisiert Daten zum Thema "Sprache, Kognition und Konzepte des Raumes" in verschiedenen Kulturen erheben kann'. *Linguistische Berichte* **154**: 413–29.

—— (1995). 'Sprache, Kognition und Konzepte des Raums in verschiedenen Kulturen', *Kognitionswissenschaft* **4**: 166–70.

—— (1996). *Classificatory Particles in Kilivila.* New York: Oxford University Press.

Steiner, Gerhard (1991). 'Spatial Reasoning in Small-Size and Large-Size Environments: In Search of Early Prefigurations of Spatial Cognition in Small-Size Environments'. Mimeo, Basle.

Steinhauer, Hein (1991). 'Demonstratives in the Blagar Language of Dolap (Pura, Alor, Indonesia)', in Tom Dutton (ed.), *Papers in Papuan Linguistics,* i. 177–221. Pacific Linguistics A-73. Canberra: Australian National University.

Stiles-Davis, Joan, Kritchevsky, Mark, and Bellugi, Ursula (eds.) (1988). *Spatial Cognition: Brain Bases and Development.* Hillsdale, NJ: Lawrence Erlbaum.

Svorou, Soteria (1986). 'On the Evolutionary Paths of Locative Expressions', *Proceedings of the Twelfth Annual Meeting of the Berkeley Linguistics Society,* 15–17 Feb. 1986, 515–27. Berkeley: Berkeley Linguistics Society.

Talmy, Leonard (1978). 'Figure and Ground in Complex Sentences', in Joseph H. Greenberg (ed.) *Universals of Human Language,* iv: *Syntax,* 625–49. Stanford, Calif.: Stanford University Press.

—— (1983). 'How Language Structures Space', in Herbert L. Pick, and Linda P. Acredolo (eds.), *Spatial Orientation: Theory, Research and Application,* 225–320. New York: Plenum Press.

Tanz, Christine (1980). *Studies in the Acquisition of Deictic Terms.* Cambridge: Cambridge University Press.

Teljeur, Dick (1987). 'Spatial Orientation among the Giman of South Halmahera', in *Halmahera Dan Raja Ampat Sebagai Kesatuan Majemuk.* Studi-Studi Terhadap Suatu Daerah Transisi. *Buletin Leknas* 2(2) (1983). Terbitan Khusus, ed. E. K. M. Masinambow, 347–366. Jakarta: Lembaga Ekonomi dan Kemasyarakatan Nasional.

Vater, Heinz (1991). *Einführung in die Raum-Linguistik.* Cologne: Gabel Verlag.

Wassmann, Jürg, and Dasen, Pierre (1994). 'Yupno Number System and Counting', *Journal of Cross-cultural Psychology* **25** (2): 78–94.

Watson, Robert I. (1979). *Basic Writings in the History of Psychology.* New York: Oxford University Press.

Weissenborn, Jürgen (1985). ' "Ich weiß ja nicht von hier aus, wie weit es von dahinten ist": Makroräume in der kognitiven und sprachlichen Entwicklung des Kindes', in Harro Schweizer (ed.), *Sprache und Raum,* 209–44. Stuttgart: Metzler.

Weissenborn, Jürgen (1986). 'Learning How to Become an Interlocutor: The Verbal Negotiation of Common Frames of Reference and Actions in Dyads of 4–14 Year Old Children', in Jenny Cook-Gumperz, William A. Corsaro, and Jürgen Streeck (eds.), *Children's Worlds and Children's Language*, 377–404. Berlin: Mouton de Gruyter.

—— and Klein, Wolfgang (1982). 'Introduction', in Jürgen Weissenborn and Wolfgang Klein (eds.), *Here and There: Cross-linguistic Studies on Deixis and Demonstration*, 1–12. Amsterdam: John Benjamins.

Wunderlich, Dieter (1982). 'Sprache und Raum', *Studium Linguistik* **12**: 1–19; **13**: 37–59.

—— (1986). 'Raum und die Struktur des Lexikons', in Hans-Georg Bosshardt (ed.), *Perspektiven auf Sprache: Interdisziplinäre Beiträge zum Gedenken an Hans Hörmann*, 212–31. Berlin: Walter de Gruyter.

Zola-Morgan, Stuart, and Kritchevsky, Mark (1988). 'Spatial Cognition in Adults', in Stiles-Davis et al. (1988: 415–21).