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Perspectives on Prepositions

Edited by
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Preface

The present volume evolved from a workshop on prepositions held at Hamburg University on June 26 and 27, 1998. Nine of the fifteen papers presented at the workshop are included in this volume; three more contributions were invited (Rauh, De Mulder & Vanderheyden, Navarro i Ferrando). The intention of the workshop was to bring together the multifaceted perspectives on prepositions that have been developed in modern linguistics.

We would like to express our thanks to all the workshop participants in making this workshop a success. We are also grateful to Frau Elizabeth Himmler and the student assistants at the the Institut für Anglistik und Amerikanistik for their organizational help. This workshop was organized while the first editor of this volume was a research fellow of the Alexander von Humboldt Stiftung at the Institut für Anglistik und Amerikanistik (University of Hamburg). The (financial) support of the Alexander von Humboldt Stiftung is hereby gratefully acknowledged.

We would also like to thank all the authors for their contributions and for their speediness at every stage of the editorial process. A special word of thanks goes to the series editor, Prof. Dr. Heinz Vater, for his enthusiasm and support in seeing this project through. Finally, we would like to acknowledge the invaluable work of Bram Renmans in preparing the first formatted version.

Hubert Cuyckens & Günter Radden

Introduction

The papers collected in this volume offer different perspectives on prepositions. Some papers mainly discuss syntactic (and morphological) aspects of prepositions; other papers predominantly focus on cognitive aspects. All the papers are, however, concerned with the semantics of prepositions The book is, accordingly, divided into two main parts: Part I: "Syntactic-Semantic Perspectives on Prepositions"; Part II: "Cognitive-Semantic Perspectives on Prepositions."

Part I: Syntactic-Semantic Perspectives on Prepositions

In the generative tradition, approaches to the syntax of prepositions tend to adopt the X-bar theory of phrase structure, according to which prepositions determine PPs as their maximal projections. In other words, prepositions function as heads of prepositional phrases and may, like the heads of other phrases, take complements and specifiers. For example, in *right above your head*, the determiner phrase *your head* is the complement of P and the modifying adverb *right* is its specifier. Within this framework, prepositions share many syntactic properties with other word classes: they license, in particular, an argument structure potentially comprising external, internal, and referential arguments; like verbs, they constitute a case-assigning category, and they may be transitive or intransitive. The first three papers (Rauh, Haumann, Zhang) are set within this context of recent generative grammar. Rauh demonstrates that, in contrast to general assumptions in the literature, the potential internal structure of the projections of prepositions shows observable differences, and that these differences can be explained on the basis of the prepositions' different lexical properties. Haumann focuses on temporal prepositions, and discusses their internal and external syntax. Zhang provides a unified syntactic account of spatial phrases which incorporates the three semantic elements making up a spatial expression: the locative relation, the place value, and the reference entity.

A second set of papers reports on results of research into determinants of grammatical variation in English. Mondorf examines the effect of different degrees of syntactic complexity manifested in the presence or absence of a prepositional complement on the choice of synthetic or analytic comparative forms. Rohdenburg looks at several prepositional variation phenomena that are sensitive to the so-called "Complexity Principle," which states that more explicit (lexico-)grammatical variants tend to be preferred in cognitively more complex environments.

Di Meola's paper looks at the issue of the change from dative to genitive and from genitive to dative with prepositions in German. This case alternation, in Di Meola's view, can only be accounted for in terms of grammaticalization, a process which is characterized by

progressively increasing morpho-phonological, semantic, and syntactic differentiation from the original form. The final paper in this section is situated within the research tradition that investigates the relation between verb meaning and argument structure; in particular, its author, Hottenroth, focuses on the interaction between the semantic structure of verbs of motion and prepositional phrases denoting goal/source or place.

Individual contributions to Part I

In her paper "Prepositions, Features, and Projections," **Gisa Rauh** argues against the view generally assumed in the literature that all prepositions head prepositional phrases with the same internal structure. Instead, she distinguishes between three different types of prepositional forms, and she demonstrates that any differences in the potential internal structure of their projections can be explained on the basis of the different lexical, i.e. grammatically relevant, properties of the prepositional types. In particular, Rauh distinguishes the following three types, which are exemplified in (1)–(3): (i) lexical prepositions, (ii) governed or case prepositions, and (iii) grammatical prepositions; the latter two categories are subsumed under the general heading "grammaticalized" prepositions.

(1)   Mary looked at the vase *on the shelf.*
(2)   Joe relied *on Jim's promise.*
(3)   Bill bought the flowers *at a good price.*

The lexical properties a preposition can be specified for are: (i) theta-features (i.e. those features which are specified in an argument structure, namely external <ext>, internal <int>, and referential <ref> arguments); (ii) operator-features; (iii) quantifier-features; and (iv) formal morpho-syntactic features. Lexical prepositions, such as *on* in (1), always have the theta features <ext> and <ref> and potentially also <int>, they exhibit the case-assigning feature [assign OBJ], and they may be specified positively for measure phrases. Governed or case prepositions, such as *on* in (2), differ from lexical prepositions in that they are governed, or lexically selected, by their heads and, therefore, do not have theta-features of their own, nor do they license determiner-like operators or quantifier-like elements. Grammatical prepositions (cf. 3), finally, exhibit the theta features <ext> and <int> and potentially the case feature [assign OBJ]. Rauh concludes, then, that prepositions should not be defined in the lexicon on the basis of rather non-revealing descriptions such as [-N] and [-V], which assume that all prepositions are syntactically alike, but that prepositions fall into natural classes (such as illustrated in (1)–(3)). Each of these classes exhibits a different set of lexical, grammatically relevant, feature specifications and determines different projections.

   Dagmar Haumann's paper "The Projections of Temporal Prepositions" looks into the internal and external syntax of temporal prepositions within the framework of the Minimalist Program. Starting out from the assumption that homophonous elements such as *before*, which traditional grammar may categorize as prepositions, subordinating conjunctions, or adverbs, are in fact members of one and the same syntactic category, the author argues that the argument structure of temporal PPs contains one external argument, at most one internal argument, and a referential argument. Whereas the external and the internal

argument define syntactic argument positions within PP, the referential argument encodes the ontological category of time and reference properties of the temporal preposition. The core of the paper focuses on the set of functional projections within the extended projection of P the presence of which is determined by the argument structure and the Case-properties of the individual temporal prepositions.

Niina Ning Zhang's paper "Movement within a Spatial Phrase" is concerned with the issue of the internal semantic structure of spatial expressions. A spatial expression can be semantically decomposed into the three elements Locative Relation (LR), Place Value (PV), and Reference Entity (RE). The three elements are realized by separate forms in the English prepositional phrase *from behind the table*, where *from* expresses the LR of Source, *behind* expresses the PV of BACK SPACE, and *the table* expresses the RE element. Not all three elements need be lexicalized, however: for example, in (4) as well as in (5), the preposition *behind* expresses the PVs but the LRs are not lexicalized: in the former situation, the LR is understood to be that of a Route, in the latter that of a Goal.

(4) Trevor went behind the curtain to the table.
(5) Trevor went behind the curtain and stayed there.

A central issue of this paper is that of accounting for the ordering of the three forms. In her cross-linguistic study, Zhang finds three basic orders: (i) LR – RE – PV (as in Chinese), (ii) LR – PV – RE (as in English), and (iii) RE – PV – LR (as in Japanese). Zhang derives these orders by raising operations from a split spatial phrase (SP) structure in which LR is the head of the higher SP and PV the head of a lower SP with RE as its complement.

Britta Mondorf's paper "The Effect of Prepositional Complements on the Choice of Synthetic or Analytic Comparatives" examines the effect of the syntactic environment, and in particular the presence or absence of a prepositional adjective complement on the distribution between analytic or synthetic adjectival comparatives. There is general consent in the literature that trisyllabic words take the historically more recent analytic comparatives and superlatives and that monosyllables take synthetic variants, with disyllabic words being subject to variation. Mondorf's analysis of computerized corpora indicates that given the right syntactic environment, even monosyllables can strikingly often violate this rule. She argues that it is the complexity of the syntactic environment, and in particular the presence of a prepositional adjective complement, that calls for the analytic variant. In particular, it appears to be those adjectives that frequently take a closely bound prepositional complement, such as *fond of, proud of,* etc., that favor the analytic form. The patterns for adjectives that are followed by a *than*-clause are less consistent. Finally, she links up this correlation between the presence of prepositional complements and the use of the analytic comparative with Givón's Proximity Principle, which states that "functional operators will be placed closest, temporally or spatially at the code level, to the conceptual unit to which they are most relevant" (Givón 1991: 89).

Günter Rohdenburg's paper "Processing Complexity and the Variable Use of Prepositions" explores four general kinds of prepositional variation: (i) the presence or absence of a given preposition, (ii) the distribution of competing prepositions, (iii) the choice between certain prepositions and the comparative particle *than*, and (iv) the rivalry between prepositions and so-called interpretative verbs. While Rohdenburg does not deny that each of the (lexico-)grammatical variants in (i)–(iv) may be largely controlled by semantic and

stylistic tendencies, this paper presents a complementary view, in that it suggests that the more explicit grammatical or grammatico-lexical variants tend to be preferred in cognitively more complex environments (the so-called "Complexity Principle"). For each of the types of prepositional variation in (i)–(iv), Rohdenburg presents a detailed case study making use of a large corpus of British and American newspapers. The complexity factors giving rise to prepositional variation include (i) structural factors such as non-canonical orderings of major constituents, as produced, for instance, by relativization or interrogative clause formation, and (ii) semantic/conceptual factors such as the degree of semantic specificity of the superordinate predicates. For instance, the preposition *in* following *have difficulty* is far less omissible in a relativized sentence such as (6a), which is structurally and therefore cognitively more complex, than in (6b), which has canonical ordering:

(6)   a. The difficulty they had (in) getting there.
       b. They had difficulty (in) getting there.

In a similar vein, *in* is lost much more frequently following the less specific verb *have* + *difficulty* than following the more specific verb *experience* + *difficulty* (which, being semantically more specific, is cognitively more complex).

Claudio Di Meola looks into the issue of case alternation with prepositions in German. In particular, his paper "Präpositionale Rektionsalternation unter dem Gesichtspunkt der Grammatikalisierung: Das Prinzip der 'maximalen Differenzierung'" examines the large number of morphologically transparent prepositions in German which may, without any change in meaning, be construed with a dative or a genitive NP. Originally, these case-alternating prepositions were restricted to one case: prepositions such as *trotz* 'in spite of,' *dank* 'thanks to,' and *entsprechend* 'according to' governed the dative, while prepositions such as *innerhalb* 'within,' *während* 'during,' and *statt* 'instead of' governed the genitive. Di Meola demonstrates that the case shifts in these prepositions can only be accounted for in terms of a grammaticalization process, in which the later form (i.e. the preposition governing the new case) is morphologically, semantically, and syntactically maximally different from the original form (the principle of "maximal differentiation from the original structure"). This means that, after a preposition's semantic reanalysis or grammaticalization from content word to function word – whereby its original content meaning is often still transparent – its reanalysis can be further maximized (or made more visible) by using it with a different case form (and potentially change their word order with respect to the NP). The principle is iconically motivated in that a change in function is marked by a change in form. Large-scale corpus data reveal that number and complexity of the NP also play a role in the choice of case: singular and simple NPs tend to be construed in the dative while plural and complex NPs tend to be construed in the genitive. The case preferences with respect to number are also motivated by the principle of maximal differentiation: the case shifts tend to be strongest where the original case form is most marked. The genitive form is more marked in the singular and, therefore, tends to shift to the dative, while the dative form is more marked in the plural and, hence, tends to shift to the genitive.

Priska-Monika Hottenroth's paper "Fortbewegungsverben und Ortswechsel im Französischen" contributes to the widely discussed issue of the syntax-semantics interface, and particularly to the question of the relation between verb meaning and argument structure. The study focuses on intransitive verbs of motion in French and their combination with

prepositional phrases denoting the goal or the source of the movement. Generally, two major classes of verbs of motion are distinguished (see Talmy 1975 and others): (i) verbs like *arriver* 'arrive,' which take (static) spatial prepositional phrases to specify the goal, as in (7), and (ii) verbs like *courir* 'run,' and *flotter* 'float,' whose prepositional phrases do not denote a goal but function as PLACE-adjuncts, as in (8):

(7) *Jean est arrivé dans le parc.*
     'Jean arrived in the park.'
(8) *La bouteille a flotté dans la grotte.*
     'The bottle floated in the cave.' (not: 'into the cave')

The contrasting behavior of the two verb classes is dependent on the presence of a sub-lexical predicate CHANGE (LOC(x, REGION (y))). This semantic component is present in verbs like *arriver* but missing in verbs like *courir* and *flotter*, which denote a continuous motion. It is one of the aims of the paper to explain apparent exceptions and to show that the CHANGE-component is also responsible for the fact that the *arriver*-class of verbs can take prepositional phrases specifying the source as in (9), while continuous motion verbs cannot (10).

(9) *Jean sorti de l'université.*
     'Jean left the university.'
(10) **Jean courait de l'université.*
     *'Jean ran from the university.'

Part II: Cognitive-Semantic Perspectives on Prepositions

The semantics of prepositions became a major strand of research in cognitive linguistics in the early 1980s – in fact, studies on the polysemy of prepositions and particles, in particular the work of Brugman (1981) on *over* and Lindner (1981) on *up* and *out*, had a significant influence on the development of cognitive semantics. More than any other word class, prepositions and particles are multiply polysemous. Looked at from a cognitive perspective, their seemingly unrelated uses could be shown to form a complex "family-resemblance" network in which the different senses are meaningfully "chained" to one another. All the papers subsumed in this Part "Cognitive-Semantic Perspectives on Prepositions" are, in one way or other, concerned with the issue of prepositional polysemy.

The central senses of the basic prepositions tend to belong to the domain of space, and as spatial expressions, prepositions reflect our physical experience of space. Primary among our spatial experiences is that of motion. In motional situations, the division of a scene into a moving trajector and a stable landmark is most conspicuous. The coding of the special situation of a trajector's motion "over" a path as a landmark in German *über* is analyzed by Meex.

Abstract senses of prepositions tend to be derived from concrete, spatial senses by means of generalization or specialization of meaning or by metonymic or metaphoric transfer. The polysemy of prepositions is often claimed to be a reflection of diachronic

evolution. De Mulder and Vanderheyden's study of the evolution of French *sur* 'on' corroborates the primacy and stability over time of the prototypical spatial senses of this preposition while changes of its extended senses defy any such systematic development.

The prototype view of prepositions is not shared by all cognitivists. In her analysis of the three Dutch prepositions *aan* 'on,' *op* 'on,' and *tegen* 'against,' Belien argues that prepositional senses are constituted by a single schematic meaning, which she refers to as "Platonic" concept. The relevant component of meaning characterizing the prepositional concepts analyzed is that of force dynamics. In the same vein, Navarro i Ferrando rejects the traditional approach of solely considering the landmark's geometric configuration; prepositional meanings are, as illustrated for the preposition *at*, also defined by force dynamics and function.

The two concluding papers are devoted to motivational aspects of prepositions. Radden and Matthis try to discover the cognitive motivation behind the use of the prepositions in *similar to* and *different from* and its variants *to* and *than*. Cuyckens examines changes of meaning in four English prepositions and concludes that metonymy is a more basic motivational factor triggering semantic extensions than metaphor.

Individual contributions to Part II

In her paper "Die Wegpräposition *über*," **Birgitta Meex** applies the framework of cognitive grammar to the analysis of one of the central senses of the German preposition *über*, that of path. Its English equivalent, *over*, has been the subject of many cognitive-linguistic studies, which mainly focused on the semantics of the preposition. As a grammatical category, prepositions profile a relationship between between two entities, a trajector and a landmark. The paper is concerned with the sense of *über* in which the landmark defines a path for the motion of the trajector. Depending on aspectual notions of the motion event, two types of path need to be distinguished: imperfective motion as in *He tramped over the field*, which describes an incomplete event and involves a summary path covered by the trajector, and perfective motion as in *He rowed over the Atlantic*, which describes a completed event and involves the reaching of a goal or at least the crossing of the boundary of a landmark. The preposition *über* may also be used to describe a static situation as motional as in *The linen was spanned over the street*. This phenomenon of subjective motion needs to be distinguished from subjectifications as in *The dwarfs live over the mountain*, in which the speaker's reference point is construed subjectively. The conceptual difference between these situations is reflected in the case forms assigned by German *über*: the former situation is expressed by the accusative case, which is typically used for the notion of path, the latter situation is expressed by the dative case, which is typically used for static, unchanging situations.

The aim of **Walter De Mulder** and **Anne Vanderheyden**'s paper "The Evolution of French *Sur*: Toward a Diachronic Approach" is both descriptive and theoretical. Its descriptive purpose is to investigate the semantic evolution of the French preposition *sur* (whose earlier forms were *sor, sus,* and *sur*); theoretically, it wants to examine the relevance of diachronic prototype semantics – as presented in Geeraerts (1997) – to the study of the evolution of prepositions. In light of the view that the polysemy of current linguistic

expressions reflects their diachronic evolution, the authors look into the evolution of *sur* in order to find the cognitive links between its various meanings. In doing so, they start from the well-established idea in cognitive semantics that the basic meaning of prepositions such as *sur* is spatial, and that other meanings are derived from this spatial meaning by metaphorical and metonymic transfers. De Mulder and Vanderheyden's analysis reveals that most of the non-spatial meanings of *sur* were already present from Old French on, and that as such the diachronic evolution of *sur* can shed little light on its synchronic semantic structure. Still, their analysis corroborates a number of predictions and observations made by Geeraerts (1997):

- – it is sometimes difficult to precisely locate the origins of new meanings;
- – the boundaries of the different meanings are in constant evolution;
- – at least in the case of *sur*, the prototypical spatial meaning does not change.

Furthermore, the authors show that the study of an items's diachronic evolution can help to establish which meanings are part of the synchronic networks and as such may partly solve Rice's (1996) question of how many distinct senses there are in a network.

In her paper "Force Dynamics in Static Prepositions: Dutch *Aan*, *Op*, and *Tegen*, **Maaike Beliën** presents an analysis of the Dutch prepositions *aan*, *op*, and *tegen* which differs from current cognitive semantic analyses in two respects. Rather than treating prepositional meaning in terms of a family-resemblance network of interrelated senses, she proposes a more unified account that describes a preposition's meaning in terms of a single Platonic concept, i.e. a single maximally schematic concept that language users abstract from experience through their perceptual and cognitive apparatus and that may adapt under contextual pressure. In addition, unlike current analyses such as Cuyckens (1991), she accounts for the differences between *aan*, *op*, and *tegen* in terms of force-dynamic properties. As such, then, she characterizes the semantics of *aan*, *op*, and *tegen* in terms of Platonic concepts that each involve contact between two entities, but which differ crucially with respect to force dynamics.

In his paper "Towards a Description of the Meaning of *At*," **Ignasi Navarro i Ferrando** sets himself the task of redefining the senses of *at* within the cognitive-linguistic paradigm. Traditionally, spatial prepositions are distinguished on the basis of the geometric shape of the landmark as a point, a surface or line, or an area or volume. The preposition *at* would, in this account, be described as referring to a landmark in the shape of a point. Navarro convincingly demonstrates the inadequacy of this approach. A prepositional concept involves many more dimensions which need to be considered for an adquate description. The conceptual schema of *at* is characterized by a specific kind of interaction of the trajector with the landmark. For example, the trajector has a functional front that determines the relationship with the landmark in a canonical way. Navarro describes this conceptual schema as "ENCOUNTER Schema." The ENCOUNTER Schema gives rise to three configurations or conceptual regions of *at* as well as the corresponding subsenses. The configuration senses are:

(i)   force-dynamic configuration senses, in which the trajector searches for contiguity as in *to snatch at something* or moves away from the landmark as in *at my sugges-tion*;

(ii)   topological configuration senses where there is coincidence of trajector and land-mark as for example with periods of time which are coincident with events as in *The execution took place at dawn*;

(iii) functional configuration senses, which highlight a canonical interaction as in *ships at sea*.

The senses of *at* identified in this paper are shown to form a radial category.

An answer to a seemingly trivial question is searched for in **Günter Radden** and **Eliza-beth Matthis**'s paper "Why *Similar To*, but *Different From?*" The use of spatial preposi-tions with similarity and difference is obviously motivated by conceptual metaphor: simi-larity is understood in terms of closeness as in *This is close to the truth* and difference is understood in terms of distance *This is far from the truth*. But why should dynamic preposi-tions be used to describe static static situations and why should closeness and similarity be seen as motion *to* a goal and distance and difference as motion away *from* a source? Cross-linguistic comparisons show that this distribution is not restricted to English but predomi-nates as a general pattern. Radden and Matthis argue that this linguistic pattern points to an underlying folk model, in which close and similar things are seen as being attracted and distant and different things as being repulsed. English is unique among the languages studied in that *different* may not only be contrued with the Source preposition *from*, but also with the Goal preposition *to* and the Comparison preposition *than*. Usually, these prepositional alternatives are claimed to be no more than stylistic or geograpical variants. The authors claim, however, that each of the three prepositions is associated with its own schematic meaning: *from* evokes the repulsion schema, *to* the the attraction schema, and *than* the comparison schema. An empirical study based on questionnaries largely confirms these assumptions.

In his article "Metonymy in Prepositions," **Hubert Cuyckens** examines semantic rela-tions in four English prepositions. He shows that metonymy plays at least as important a role in motivating (synchronic) semantic extensions and (diachronic) semantic change as does metaphor. In particular, he demonstrates (i) that the metonymies CIRCUMSTANCE FOR CAUSE and GOAL FOR CAUSE underlie semantic extensions in the prepositions *with* and *for*, respectively, (ii) that SPATIAL GOAL FOR PURPOSE ultimately motivates the change from *to* as allative-dative marker to its use as a marker of the *to*-infinitive, and (iii) that in the change from *by* as a spatial preposition to its use as a passive marker such metonymies as PATH FOR MEANS OF TRANSIT and MEANS FOR CAUSE have played an important role. This analysis gives Cuyckens the opportunity to look more closely at the distinction between metaphor and metonymy. In line with recent studies on metonymy (Kövecses & Radden 1998; Radden 2000), he argues that when the semantic relation between two concepts can be motivated metaphorically as well as metonymically, the metonymic relation, which is based on contiguity within one domain, is more basic.

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Part I:

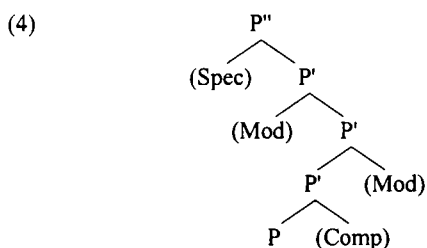Syntactic-Semantic Perspectives on Prepositions

Gisa Rauh

Prepositions, Features, and Projections

1. Introduction*

This paper is concerned with an analysis of the projection properties of prepositional forms in examples like the following:

(1)   a. Mary put the vase [*on the shelf*].
       b. The car stood [*behind the bus*].
(2)   a. John relied [*on Jim's promise*].
       b. They were angry [*about the delay*].
(3)   a. Bill bought the flowers [*at a good price*].
       b. The child spoke [*in a choked voice*].

In general, the constituents in brackets are all represented as projections of P, i.e. as PPs. It is also claimed that the potential internal structuring of PPs conforms to the following scheme (see Radford 1988: 246f):

(4)

```
              P"
             /  \
        (Spec)   P'
                /  \
            (Mod)   P'
                   /  \
                  P'   (Mod)
                 /  \
                P   (Comp)
```

Spec(ifier) = measure phrases (e.g. *two meters*, *right*)
Mod(ifier) = AP (e.g. *far*, *deep*), PP
Comp(lement) = NP, CP, PP, Ø

What remains unaccounted for, however, is the fact that only the prepositional forms in examples like (1) provide the potential for a complete instantiation of (4). And what remains unexplained is what determines this potential.

    The present paper is concerned with these problems. In accordance with assumptions of the Principles and Parameters Theory (PPT)[1] and the Minimalist Program (MP),[2] it will be illustrated that the potential for lexical items to form heads of complex constructions is dependent on their lexical properties. These properties determine the licensing of constituents within maximal projections. With respect to prepositional forms like those in (1), (2),

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* I dedicate my contribution in this volume to my valued colleague and friend Ekkehard König on the occasion of his 60th birthday.
[1] See for example Chomsky (1985) and Speas (1990).
[2] See especially Chomsky (1993, 1995).

and (3) it will be argued – and demonstrated – that observable differences concerning the potential internal structure of their projections can be explained on the basis of different lexical properties.

The remaining part of this paper is structured as follows: Section 2 introduces lexical properties which license constituents in a structure. This is first demonstrated using examples from outside the problematic area of prepositional forms. Section 3 then illustrates the relationship between the licensing of constituents and the lexical properties introduced in Section 2, considering the prepositional forms of examples like those in (1). In various papers, I have called these "lexical" prepositions (e.g. Rauh 1995, 1996) and identified them as elements of a lexical category (Rauh 1997). Section 4 analyzes the licensing of constituents by the prepositional forms like those in (2) and (3) which together are considered as "grammaticalized prepositional forms." Finally, Section 5 discusses the results and comments on the differences which have been pointed out between the three types of prepositional forms.

2. Features and projections: On the licensing of constituents in a structure

For the licensing of constituents in a structure, the following types of lexical properties are relevant: (i) theta-features, (ii) operator-features, (iii) quantifier-features, and (iv) formal morpho-syntactic features.[3] Of the set of features representing these feature types, only those will be considered which are relevant for prepositional forms and their projections.

Theta-features are those features which are specified in a theta-grid or in an argument structure. They comprise external <ext>, internal <int>, and referential <ref> arguments.[4]

Within projections of lexical heads, <ext> licenses specifiers which are interpreted as subjects; for example, *John* in (5), the licensing being represented by coindexation in (5c):[5]

(5)   a. *snore:* <ext>
       b. *John snores.*
       c.   VP
                  ╱⟍
             DP$_i$ V
              | |
            John   *snores*
                     <ext$_i$>

In this case, the type of licensing is theta-marking, which means that there is a thematic relation[6] between the theta-marker and the theta-marked constituent and that the theta-

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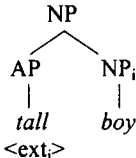3 These features are discussed in Rauh (2000a, Section 4.1) in more detail.
4 The modes of licensing by theta-features characterized here are based on suggestions presented by Higginbotham (1985).
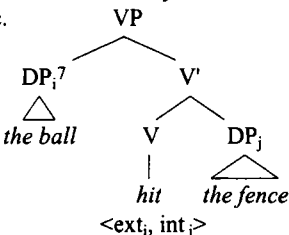5 The analysis in (5c) which locates the subject internal to VP in underlying structure is motivated, for example, by Koopman & Sportiche (1991).
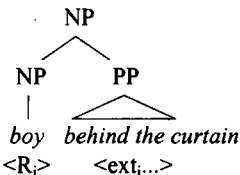6 Examples of thematic relations are "Agent," "Theme," "Location," etc.

marked constituent as a constant replaces the variable in the argument structure of the theta-marker. Via theta-identification <ext> licenses adjuncts as modifiers:

(6) a. *tall*: <ext>
     b. *tall boy*
     c. NP
         ╱╲
      AP   NP$_i$
      │   │
     tall *boy*
     <ext$_i$>

Internal arguments, i.e. complements, are licensed by <int>, again via theta-marking:

(7) a. *hit* <ext, int>
     b. *the ball hit the fence*
     c.   VP
             ╱────╲
        DP$_i$[7]   V'
         △   ╱╲
      the ball   V   DP$_j$
                   │   △
                  hit *the fence*
                <ext$_i$, int$_j$>

Via theta-identification, <ref> on the one hand licenses adjuncts. In this case, the feature <ref> of the head of a construction is identified with the feature <ext> of the adjunct:

(8) a. *boy* <ref: R>
     b. *boy behind the curtain*
     c.   NP
              ╱─╲
         NP   PP
         │   △
        boy *behind the curtain*
        <R$_i$>   <ext$_i$...>

Semantically this identification or "unification" yields coordinate predicates providing the following interpretation for *boy behind the curtain*:

(9) boy' (R) & behind-the-curtain' (R)

<R> in this case is a specification of <ref> and determines the sort of referent denoted by nouns, namely individuals, i.e. objects in the widest sense.

---

[7] DP as the maximal projection of D(eterminer) reanalyzes traditional NPs in the light of insights concerning, for example, structural properties of pronouns like *we, these, those,* and others which may be used either intransitively or transitively, as in *we/these/those linguists,* and which are therefore analyzed as intransitive or transitive representatives of D. More important for a re-analysis of NPs and DPs, however, is the fact that elements of the category D are operators in the sense described below.

On the other hand, <ref> licenses operators, which are themselves specified by operator-features. In the context of nouns, operators are lexically represented by determiners:

(10)　a.　*a*:　　　[-def(inite)] (<R>)
　　　　　this:　　[+def,+deic(tic),+prox(imal)] (<R>)[8]
　　　b.　*a/this boy*
　　　c.

```
                    DP
                  /    \
               D         NP
               |          |
         a [-def]ᵢ        N
         this [+def,       |
               +deic,     boy
               +prox]ᵢ    <Rᵢ>
```
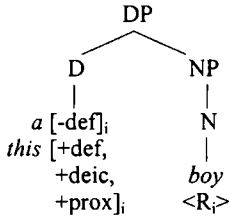
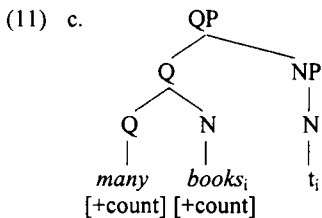The licensing in this case is achieved via theta-binding. Semantically this means that out of the set of individuals satisfying the predicate expressed by the NP, the determiners select referents according to their specification. Within the PPT and the MP framework, determiners are syntactically described as elements of the functional category D in the extended projection of N, not inside the NP, as is shown in (10c). In contexts other than N, the analysis of operators is similar.

Quantifier-features are those features which license quantifiers in the context of lexical items. For nouns, Löbel (1989, 1990) demonstrates that quantifiers are dependent on the inherent features [±count]. These, then, are the features which license quantifiers as functional elements in extended projections of N, given that the quantifiers as well as the nouns exhibit these features and that there is agreement between the two:

(11)　a.　*many* [+count]
　　　　　much [-count]
　　　b.　*many* [+count] *books* [+count]
　　　　　**much* [-count] *books* [+count]

In the framework of the MP, agreement of these features is checked via head-to-head movement:

(11)　c.

```
                  QP
                /    \
              Q        NP
            /   \       |
          Q      N      N
          |      |      |
        many  booksᵢ    tᵢ
       [+count] [+count]
```

If the features do not agree or if one of the partners lacks this feature, then a potential quantifier is not licensed.

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[8]　In the context of [+deic], the feature [+def] is redundant. It is therefore not represented in the examples to follow.
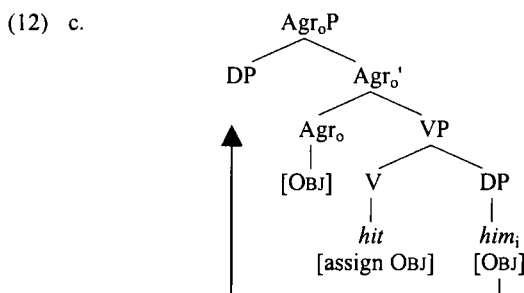
Amongst the formal morpho-syntactic features there are case-features.[9] They are of two types, namely those that specify case-bearers and those that specify case-assigners:

(12) a. *him*   [OBJ]
       hit   [assign OBJ(ective CASE)][10]

Since only NPs or DPs bear case, the contextual feature [assign OBJ] licenses the syntactic category of complements which as such are licensed by <int>:

(12) b. *hit*   [assign OBJ] *him* [OBJ]

In the MP, the licensing of NPs or DPs is described via spec(ifier)-head agreement. To check agreement – in this case of the two case-features – the NP or DP is moved to the specifier position of a superordinate agreement phrase Agr_oP[11] at LF, i.e. invisibly to the phonetic interpretation of the phrase:

(12) c.

```
                 AgroP
                /     \
              DP      Agro'
              ▲      /    \
              |   Agro     VP
              |    |      /   \
              |  [OBJ]   V     DP
              |          |     |
              |         hit   himᵢ
              |    [assign OBJ] [OBJ]
              |_____|
```

If the case-features do not agree, the constituent is not licensed.

It is important to note that there is an immediate dependency relation between the licensing of constituents and lexical properties: the presence of the lexical properties is a prerequisite for the licensing of constituents in a projection. Therefore, the lexical prop-erties of lexical items can be derived from their empirically attested projection potential. On the other hand, the presence of these properties explains this potential. In what follows, this dependency will be exploited to describe systematic differences between prepositional forms like those presented in (1), (2), and (3). To avoid confusion, it should be noted beforehand that, due to the modes of licensing discussed here, possible projections of prep-ositions will crucially differ from (4), in that the elements under Spec, which are located within PP in (4), will, in the analysis presented here, appear outside of PP in the projection extended by functional categories.

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[9] The formal morpho-syntactic features include also gender, number, and tense features (cf. Chomsky 1995).

[10] The notation [assign OBJ] is here adapted to the notation applied in the MP by Chomsky (1995). In previous papers, I represented this property as ">+S:obj<", with "+S" expressing "structural" rather than "inherent" case and "obj" specifying "structural case" as "objective."

[11] Agr_oP is an agreement phrase which checks grammatical features shared by a lexical head and its complement (= o(bject)). The relevant features here are case-features, the case-feature of the case-assigner *hit*, and the case-bearer *him*. In this framework, Agr_oP is represented whenever agreement between grammatical features of a lexical head and its complement is required in a language.

3. Features and projections of lexical prepositions

Consider first the following examples of projections of the spatial prepositions *on* and *behind*, which are representative of others as well:

(13) a. Mary looked at the vase [on *the shelf*].
      b. Mary looked at the vase [on the shelf *near Pete's photograph*].
      c. Mary looked at the vase [*here* on the shelf].
      d. Mary looked at the vase [*right* here on the shelf].
      e. *Mary looked at the vase [*several inches* on the shelf].
(14) a. Mary owns the car [behind *the bus*].
      b. Mary owns the car [behind the bus *in front of a green convertible*].
      c. Mary owns the car [*here* behind the bus].
      d. Mary owns the car [*right* here behind the bus].
      e. Mary owns the car [*several meters* behind the bus].

Example (13a) shows that *on* licenses a DP-complement. Therefore, the set of lexical properties of *on* must include the theta-feature <int> as well as the case-feature [assign OBJ]. Since *on the shelf* in (13a) is an adjunct in the projection of *vase*, the set of features of *on* in addition must include <ext>.

In (13b), *on the shelf* is modified by *near Pete's photograph*. Thus, *near Pete's photograph* is an adjunct in the projection of *on*. The licensing of an adjunct permits the conclusion that the feature specification of *on* includes the theta-feature <ref>. Semantically this means that *on the shelf near Pete's photograph* refers to a space for which the predicate on'(the-shelf,S_l) as well as the predicate near'(Pete's-photograph',S_l) is satisfied. (S_l) (= "locative space") here specifies "ref" and indicates that spatial prepositions denote locative spaces.
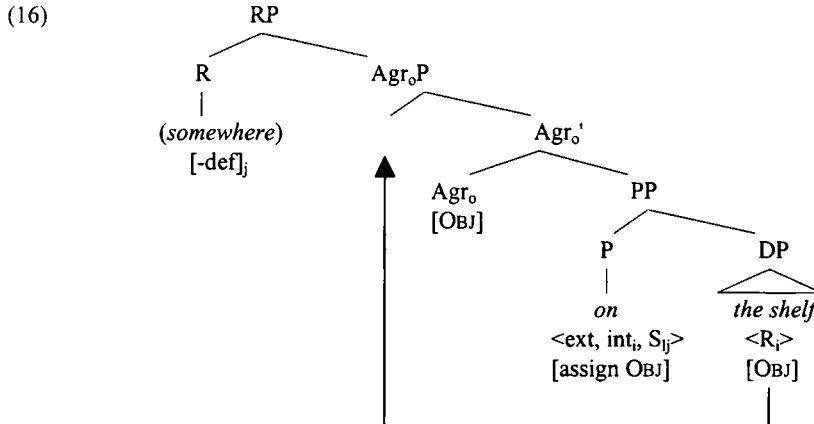
The licensing of *here* in the projection of *on* in (13c) also allows the conclusion that the lexical properties of *on* include the theta-feature <ref> or rather <S_l>, which in this case is theta-bound. In this reading, *here* – like determiners in extended projections of N – functions as an operator.[12] Within the space denoted by *on the shelf*, it determines a partial space which satisfies the specification [+deic,+prox] and thus is analogous to *this/these*. (15) illustrates that *here* may be replaced by the indefinite form *somewhere*, which is analogous to the determiners *a/some*:

(15) Mary looked at the vase *somewhere* on the shelf.

Since dropping *somewhere* in (15) does not yield a change in meaning, the functional (operator-)category in the extended projection of *on* in the default case contains a phonetically empty head specified by [-def] – analogous to plural DPs. In (16), this category is

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[12] In a second reading, *here* and *there* represent autonomous "intransitive" prepositions. The difference between the two readings is equivalent to *this* und *that* as articles – as in *this/that book* – and as autonomous pronouns. An example of *here/there* in this second reading is *the book here/ there*. See also Rauh (2000b).

represented by R.[13] The licensing of the DP complement is achieved via theta-marking by <int> and via agreement of the two case-features, which is checked by moving the DP to the specifier position of Agr_oP:

(16)

```
                    RP
                   /  \
              R          Agr_oP
              |          /   \
          (somewhere)         Agr_o'
            [-def]_j         /    \
              ▲         Agr_o        PP
              |        [OBJ]        /  \
              |                   P      DP
              |                   |    /‾‾\
              |                  on    the shelf
              |            <ext, int_i, S_ij>  <R_i>
              |              [assign OBJ]      [OBJ]
              |_____|
```

In example (13d), in addition to the operator *here* the element *right* is licensed in the projection of *on*. In addition to being compatible with *here*, *right* is compatible with *there* but not with *somewhere* or *everywhere*:
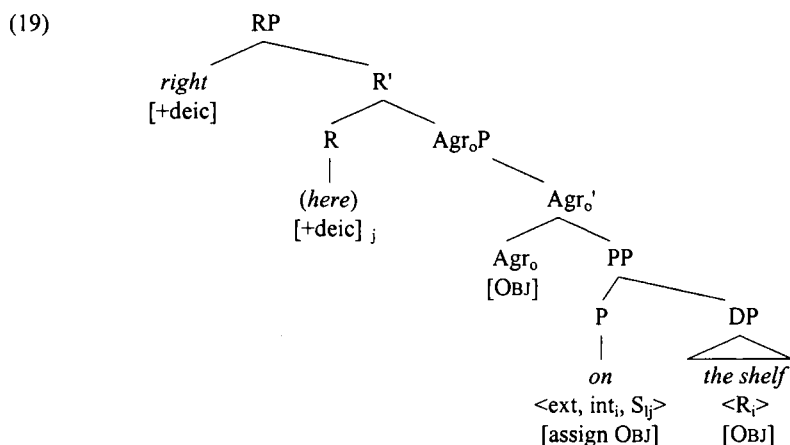
(17)　　*right*　*here* on the shelf
　　　　　　　there
　　　　　　　**somewhere*
　　　　　　　**everywhere*

It may also be used without an overtly represented operator in the context of any spatial preposition:

(18)　a.　The window is *right above* the door.
　　　b.　The house is *right across* the street.
　　　c.　The table is *right in the middle* of the room.
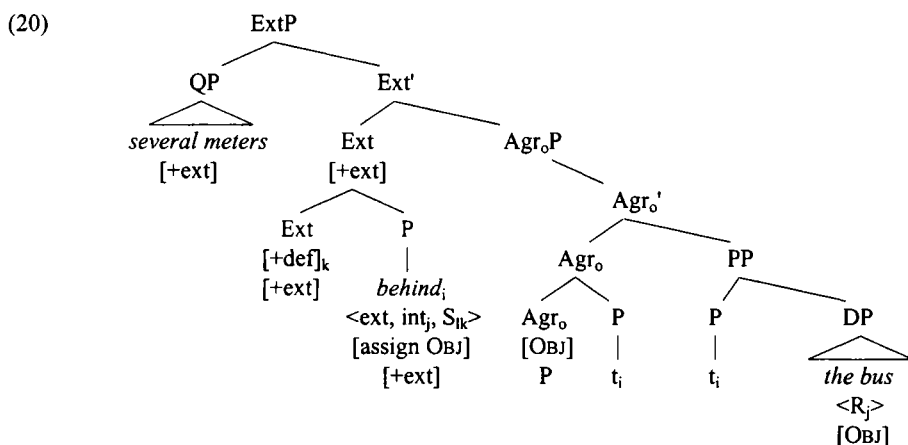　　　d.　The plane flew *right over* the house.

Semantically, *right* does not contribute much to the interpretation of these expressions. It rather expresses the pragmatic fact that according to the view of the speaker the spaces referred to satisfy the predicate expressed by the PP especially well. This observation, together with the fact that *right* is compatible with the deictic operators *here* and *there* but not with non-deictic ones, supports its analysis as a specifier of operators with the feature [+deic], which may be phonetically empty:

13　The category name "R" was first introduced by Zwarts (1992) to indicate the fact that elements of this category in Dutch represent a class of pronouns which all contain the phoneme /r/. These pronouns are therefore called r-pronouns. The name was taken over in this framework because RP in German may be read as "Raumphrase" (= *Space Phrase*) and thus names what the phrase expresses. Note that the category R must not be confused with the referential argument <R(eferent)>.

(19)

```
                        RP
                       /  \
                   right    R'
                  [+deic]  /  \
                          R    AgroP
                          |       \
                        (here)    Agro'
                        [+deic]j  /  \
                               Agro   PP
                               [OBJ] /  \
                                    P    DP
                                    |    /\
                                    on  the shelf
                         <ext, inti, Slj>  <Ri>
                          [assign OBJ]     [OBJ]
```

The licensing of *right* is based on spec-head agreement.

Example (13e) shows that *on* does not license measure phrases in its projection. The examples in (14) demonstrate that this is the only difference between the projection properties of *on* and *behind* as transitive prepositions. Example (14e) is grammatical, as are all the other examples, which are analogous to the examples in (13). This is explainable assuming an inherent feature [extension] which is specified negatively for *on* and positively for *behind*. Analogous to the quantifier-feature [±count] in the context of nouns, this feature determines the quantifiability of the extension of the spaces referred to by PPs. Measure phrases, therefore, have to be analyzed as specifiers of quantifiers which, like operators, may be phonetically empty, but only if the specifier of Ext is phonetically not empty.[14] Thus Ext, in addition, is specified as [+def]:

(20)

```
                    ExtP
                   /    \
                 QP      Ext'
                /\      /   \
         several meters Ext   AgroP
           [+ext]      [+ext]    \
                      /   \      Agro'
                    Ext    P    /   \
                  [+def]k  |   Agro   PP
                  [+ext]  behindi /\  /  \
                   <ext, intj, Slk> Agro P  P   DP
                   [assign OBJ] [OBJ] | |  /\
                     [+ext]      P   ti ti the bus
                                            <Rj>
                                            [OBJ]
```

The specification of Ext as [+def] explains with respect to extended projections of P what Haider (1988) observed concerning extended projections of N: both determiners and quantifiers may theta-bind the referential argument of a lexical head. For the referential argument

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14 This condition is in line with the "invisible category principle" postulated by Emonds (1987).

of the P-head this is represented by coindexing $<S_i>$ with [+deic][15] in (19) and with [+def] in (20).

In many cases, simultaneous determination of spatial referents of PPs by elements in Ext and R is conceptually excluded because either the one or the other identifies the denoted space exhaustively:

(21) a. Fix the second knot [*two inches/somewhere* above the first one].
      b. * Fix the second knot [*two inches somewhere/somewhere two inches* above the first one].

It is possible, however, if two specifications simultaneously contribute to the identification of a space, as in the following example:

(22) They waited [*somewhere two meters* behind the barrier].

Two meters expresses the extension of the distance from the reference object barrier'(x), which is conceptualized as a line parallel to this object. On this line, *somewhere* determines a space as the referent of the whole projection. In this case, both functional categories, R and Ext, are licensed in the extended projection of *behind*.

The properties identified for *on* and *behind* and their mode of licensing constituents is representative of a number of spatial prepositions. These properties are summarized in (23):

(23) a. *on*: $<ext, int, S_i>$ [assign OBJ]   [-ext]
      b. *behind*: $<ext, int, S_i>$ [assign OBJ]   [+ext]

(24) provides an example of the maximally instantiated projection potential of *behind* and comparable spatial prepositions:

(24) a. They waited [somewhere two meters behind the barrier near a tree].
      b.

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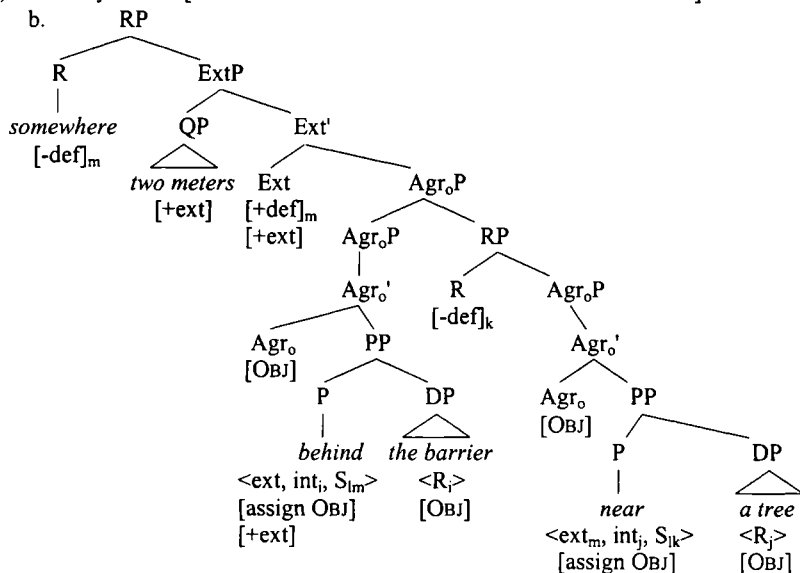
[15] Note Footnote 8 in this context.