On the Formation of Prepositional Adverbs in Modern German

A Case Study on darunter*

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In this paper, I defend the hypothesis that each prepositional adverb in Modern German is formed from an adverb and a preposition – and not from two adverbs, as recently suggested in the literature. As major support for this hypothesis, I show on the example of darunter that the intensions of the lexical meanings of non-idiomatic prepositional adverbs are compositionally built from the intensions of preposition meanings by combining them in an appropriate way with the intension of an adverb meaning.

The proposed analysis, formulated within the general framework of Integrational Linguistics (IL), also provides a solution for the animacy problem of prepositional adverbs, i.e. the problem that many prepositional adverbs in Modern German do not phorically take up animated entities, in particular, persons. This restriction follows, it is argued, from a sortal restriction inherited from the preposition meaning. While syntactic semantics can accommodate preposition meanings in order to properly relate preposition complement interpretations, there is no such accommodation in the case of prepositional adverbs, their valence being lexically reduced by one.

1 Introduction

In this paper, I shall defend the following hypothesis on the formation of prepositional adverbs¹ in Modern German:

(1) For each prepositional adverb in Modern German, there is an adverb and a preposition from which it is formed.

At first glance, this hypothesis may appear to be reasonable and straightforward. In the literature, however, it is not uncontroversial.

Recently, Krause (2003, 2007) suggested, somewhat hesitatingly, that prepositional adverbs in Modern German do not result from combining an adverb – deictic da (‘there’), deictic hier (‘here’), or interrogative and relative wo (‘where’) – with a preposition, but with a homonymous adverb which

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¹ I assume here the restrictive extension of the term “prepositional adverb” (“Präpositionaladverb”) as used, for example, by Zifonun et al. (1997) and the Dudenredaktion (2009), which includes forms like darunter, hierunter, and worunter, but excludes, for instance, hinunter and unterdessen. Prepositional adverbs are also called “pronominal adverbs”. In my view, this is a misnomer, as the words under discussion are not pronominal: as a rule, they do not substitute for nominal expressions.
diachronically underlies this preposition. Evidence for this analysis, which can be traced back at least to Paul (1916–1920: vol. 3, 154), comes from syntactic and phonological data.

In non-standard or dialectal varieties of German (especially in the north), prepositional adverbs such as *dazu* (literally, ‘to there’) may occur discontinuously – a syntactic construction known as the ‘splitting construction’ (for details, cf. Fleischer 2002: chap. II.2; Negele 2012: sect. II.C.2):

(2)  *Ich hab da gestern nicht die Zeit zu gehabt […]*.  
(I have there yesterday not the time to had  
‘I didn't have the time to yesterday.’)

(“S 5” refers to an entry in the list of sources at the end of this chapter.) For Krause (2003: 132, 2007: 469–477), the existence of this construction suggests that prepositional adverbs in German are formed from two adverbs, and not from an adverb and a preposition. Both analyses alike, however, have to explain why such bipartite words can be syntactically split up under certain conditions (that is, unless their word status is denied altogether). A solution for this problem might be to assume that, in these varieties, there are syntactically complex prepositional adverbs, consisting of more than one syntactic atom. Thus, the ‘splitting construction’ provides neither an argument in favour nor one against the hypothesis stated in (1).

A further argument concerns the phonological form of prepositional adverbs and their bases. *Zu* (‘to’), for instance, has three counterparts in Bavarian (Merkle 1975: 187 f.): *zuà* with primary lexical accent,² *zu* without primary lexical accent, and unsyllabic *z*. Merkle classifies *zu* and *z* as prepositions and *zuà* as an adverb, from which the prepositional adverb *dàzuà* and its complex variant *dà dàzuà* are formed (Merkle 1975: 177). This parallels the situation in Middle High German, where *dazuo* is formed from the adverb *zuo*, and not from the preposition *ze* (cf. Paul 1916–1920: vol. 4, 4). A similar case can be made for other prepositional adverbs in earlier stages or dialectal varieties of German (cf. Wolfrum 1970: 303 f.; Krause 2007: 472 f.). In non-dialectal Modern German, however, there are only a few free adverbs formally matching the second part of a prepositional adverb; in addition, those adverbs generally have an inappropriate meaning. *Zu*, for example, means ‘closed’ as a free adverb:³

(3)  *Die Tür ist zu.*  
  the door is closed  
  ‘The door is closed.’

‘Closed’, however, is not a component of any meaning of the prepositional adverb *dazu*. Rather, it appears that the lexical meanings of non-idiomatic prepositional adverbs in Modern German are built from preposition meanings (also acknowledged by Krause 2003: 102 f., 2007: 458, 477). If so, then the synchronic hypothesis in (1) should be maintained. The present paper aims to show that this is indeed the case.

² The grave accent in *zuà* is Merkle’s (1975: 9) indication of a fronted *a* vowel and has nothing to do with lexical accents. Back *a* is notated as *à*.
³ In former stages or dialectal varieties of (Low) German, free *zu* may also occur as a ‘preposition without overt complement’ (cf. Fleischer 2002: chap. II.6; Negele 2012: sect. II.C.5):

(i)  *ich habe nicht die Zeit zu gehabt*  
  I have not the time to had  
  ‘I didn't have time to.’

According to Krause (2007: 473–476), this syntactic construction provides further evidence for a purely adverbial formation of prepositional adverbs in German. Whether *zu* in (i) is a preposition with an unrealised optional complement or rather a homonymous adverb, however, is a problem in itself. In any case, hypothesis (1) does not exclude either alternative.
In order to do so, I shall choose darunter (literally, ‘under there’ or ‘below there’) as an example. The reduced variant drunter and the complex da drunter will not be considered here; they raise specific problems which do not arise in the case of simple, unreduced darunter. I shall show that the lexical meanings of darunter – there are at least eleven of them, I shall argue – can in fact be composed from the lexical meaning of the deictic adverb da and a lexical meaning of the preposition unter. Note that the converse does not hold. For the meaning of unter in (4), for instance, there is no corresponding darunter meaning (cf. Krause 1994: 367, 374):

(4) unter dem Läuten der Glocken  
   during the ringing of the bells
   ‘during the ringing of the bells’

The semantics proposed here for darunter will also provide a solution for the notorious animacy problem of prepositional adverbs. In general, prepositional adverbs in Modern German do not phorically take up animated entities, in particular, persons. There are, however, notable exceptions, such as darunter in the meaning ‘among a multitude there (static)’ (among-mult-there\textsubscript{stat}, for short):

(5) Viele Touristen, darunter zahlreiche Ausländer, besuchen alljährlich diese Sehenswürdigkeit.  
   many tourists among-mult-there\textsubscript{stat} numerous foreigners visit every year this sight  
   ‘Every year, many tourists, among them numerous foreigners, visit this sight.’

In a nutshell, the solution consists in sortally restricting (or, for that matter, not restricting) preposition meanings in lexical semantics, given the assumption that syntactic semantics can accommodate preposition meanings in order to properly relate them to the interpretations of nominal preposition complements, while there is no such accommodation in the case of prepositional adverbs, their valence being lexically reduced by one. I am hopeful that the proposed analysis carries over to prepositional adverbs which are based on different prepositions.

Theoretically, this paper presupposes the conception of words, stems, and meanings of Integrational Linguistics (IL) (Lieb 1983, 1992; for a recent overview, cf. Nolda 2007b: chap. 7, 2012: chap. 4). Word forms, modelled in IL as sequences of syntactically inseparable atoms, are the forms of lexical words, which in turn are conceived as pairs of a word paradigm and a lexical meaning. For the purposes of this paper, we can leave the nature of word paradigms unspecified. Lexical meanings are concepts of a certain sort, which are uniquely determined by their intension (for details, cf. Lieb 1985). Together with the interpretations of syntactic categories and syntactic functions, lexical meanings provide the basis for determining syntactic meanings, which, as a rule, involve speakers and utterances. In addition to monosemous lexical words, I also assume potentially polysemous lexicological words (Nolda 2007a, 2012), which are modelled as non-empty sets of lexical words of the same part-of-speech. For each member of a non-singleton lexicological word, there is another member to which it is formally and semantically related. Two lexical words are formally related if their paradigms overlap; they are semantically related if there is a semantic relation such as metonymy or metaphor between their lexical meanings (for a list of relevant semantic relations from a cognitive,

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4 These problems include: the (non)interchangeability of drunter and da drunter with darunter; the word status of separable da drunter; the use of drunter in pleonastic constructions like unter dem Bett drunter (literally, roughly, ‘under the bed under there’); etc. (For an in-depth empirical study of all variants of prepositional adverbs in colloquial varieties of Modern German, cf. Negele 2012.)

speaker-centric perspective, cf. Blank 2003). A lexicological word is polysemous if it includes several semantically distinct lexical words. Analogous distinctions apply to stem forms, lexical stems, and lexicological stems.

Regarding darunter, I shall assume a single lexicological word, to be called “darunter\(^{1}\)”\(^{1}\), which contains at least eleven lexical words, referred to as “darunter\(^{1}\)”\(^{1}\) to “darunter\(^{1}\)”\(^{1}\)\. Each of these prepositional adverbs is formed from the deictic adverb \(da_{1}\)\(^{1}\) and one of the prepositions \(unter_{1}\)\(^{1}\) to \(unter_{11}\)\(^{1}\) (a proper subset of the members of the lexicological word \(unter\)\(^{4}\))\. The word-formation relations between these lexical words darunter\(^{1}\), da\(^{1}\), and unter\(^{1}\)\(^{1}\) are based on word-formation relations between their lexical stems darunter\(^{1}\), da\(^{1}\), and unter\(^{1}\)\(^{1}\) (1 \(\leq i \leq 11\))\.7 Formally, one of the stem forms of da\(^{1}\) is concatenated with the stem form unter. It is a matter of debate whether the relevant stem form of da\(^{1}\) is dar or – as suggested by Zifonun et al. (1997: vol. 1, 54) and the Dudenredaktion (2009: 579) – da, followed by an interfix \(r\)\.8 In the latter case, the product stem form would not be bipartite dar unter, but tripartite dar r unter, built through both concatenation and interfixation. Due to the synonymy of lexical words with their lexical stems, however, we can ignore these complications in the following and concentrate on the corresponding lexical words as far as semantics is concerned.

The paper is structured as follows. In Section 2, I shall determine the lexical meaning of da\(^{1}\), the adverbial basis for forming the prepositional adverbs darunter\(^{1}\) to darunter\(^{1}\)\. Section 3 then discusses the lexical meanings of the prepositional bases: unter\(^{1}\) to unter\(^{1}\)\. Section 4 shows how to compose the lexical meanings of the prepositional adverbs from the lexical meanings of the bases. The paper concludes with a summary of the results in Section 5. Instead of exclusively relying on introspection, somewhat ‘fancier’ examples will be cited from original sources in the German National Corpus (Deutsches Referenzkorpus, Institut für deutsche Sprache, Mannheim) or on the Internet. Bibliographic entries for them can be found in the list of sources.

2 The adverbial basis

According to the analysis proposed here, all members of darunter\(^{4}\) are formed from the deictic adverb da\(^{1}\) and a member of unter\(^{4}\). The adverb da\(^{1}\) is deictic because its lexical meaning is deictic, too. What makes a meaning deictic, however, is controversial (for an overview, cf. Fricke 2007: 13–53). According to one tradition, deictic meanings are speaker- and utterance-relative. This view also underlies the standard conception of deictic lexical meanings in IL (cf. Richter 1988). According to another tradition, deictic meanings involve a deictic space (Bühler’s 1934 Zeitfeld) and an origo, which in the default case coincides with the speaker’s orientation at utterance time. Recently, this view has been defended by Fricke (2007) in her seminal study on verbal and non-verbal local deixis in Modern German. A major advantage of such an approach to deixis is that it can easily account for origo relocation phenomena, which are pervasive in the local domain (cf., inter alia, Klein 1978: 24–28; Fricke

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6 Similar distinctions between monosemous ‘lexical units’ and potentially polysemous ‘lexemes’ or ‘vocables’ are made by Cruse (1986: chap. 3) and Melčuk (1995: 206 f., 250). The term “lexicological word” is due to François Filandre (p.c.).

7 For a formal account of word-formation relations, cf. the Pattern-and-Restriction Theory of word formation, introduced in Nolde (2012).

8 Diachronically, dar goes back to Old High German dar or thara (‘there (dynamic)’), while da is the successor of Old High German dår or ðår (‘there (static)’) (cf. Paul 1916–1920: vol. 3, 154 f.). In Modern German, the semantic distinction is not retained.

9 As a matter of fact, unter in darunter is phonetically vowel-initial. In isolation, however, unter begins – at least in northern varieties – with a glottal stop. Provided that this phonetic difference carries over to phonology, the concatenation (and, possibly, interfixation) operation would have to be preceded by an operation deleting the initial glottal stop in unter.
2007: 133–139). For the purposes of this paper, I shall closely follow Fricke (2007). Although she does not formally specify deictic lexical meanings, it should be consistent with her intent to assume that deictic concepts have deictic places for a deictic space and an origo.

Regarding the lexical meaning of $da_1^W$ – a concept to be called “there” – further problems arise through the possibility to contrast $da$ with either proximal hier or distal dort. It would be beyond the scope of this paper to go into this matter here. Rather, I shall assume with Diewald (1991: 154–158), Klabunde (2000: 198 f.), and Fricke (2007: 94) that ‘there’ is neutral with respect to the distance from the origo, and refer the interested reader to the empirical arguments presented there.

The concept ‘there’ is uniquely determined by its intension, an attribute to be named “THERE”.¹⁰

This attribute (or rather its name) can be defined in the following, semi-formal way as a three-place intensional relation between an entity $x_1$, a deictic space $x_2$, and an origo $x_3$:¹¹

\[
\text{THERE} \equiv \left( \lambda x_1 x_2 x_3 (\exists x_4) \left( x_2 \text{ is a deictic space } \land x_3 \text{ is the origo of } x_2 \land x_4 \text{ is a location in } x_2 \land (x_1 = x_4) \lor (x_1 \text{ is designated by } x_4) \right) \right)
\]

Put differently, THERE holds between $x_1$, a deictic space $x_2$, and its origo $x_3$ if, and only if, $x_1$ is a location $x_4$ in $x_2$ or designated by that location (in a sense to be discussed presently). In an utterance of $da_1^W$, $x_4$ functions as the demonstratum in the sense of Fricke (2007) and serves to identify the denotatum $x_1$.¹² The variable “$x_1$” itself will be called “the denotatum argument”. In the view taken here, the variable “$x_4$” for the demonstratum is not externally visible in semantics and is therefore existentially bound in (6).

It is a cornerstone of Fricke’s theory that the demonstratum and the denotatum may, but need not, coincide. Let us first consider the case of deixis in the non-sign space in the sense of Fricke (2007: 123–133), where the denotatum is identical with the demonstratum. In an utterance of (7 B), for instance, the demonstratum and the denotatum can be a location in a physical deictic space:

\[
\text{(7) A: } \text{Wo hast du es versteckt?} \\
\text{Where have you it hidden} \\
\text{‘Where have you hidden it?’} \\
\text{B: } \text{Ich habe es \underline{dà} versteckt.} \\
\text{I have it \underline{there} hidden} \\
\text{‘I have hidden it there.’}
\]

(The symbol “´” denotes a syntactic fall accent and underlining an accompanying pointing gesture.) In the case of deixis in the sign space, however, the demonstratum is interpreted by the speaker as a Peircian sign for the denotatum. This is what is meant in (6) by saying that $x_1$, the denotatum, is designated by $x_4$, the demonstratum. An example at hand would be an utterance of (8) where the speaker points at a location on a photograph while uttering $da$

\[
\text{(8) Hier \underline{stehe} ich, und \underline{dà} steht \underline{mein} Brüder.} \\
\text{here stand I and \underline{there} stands my \underline{brother}} \\
\text{‘I am standing here, and my brother is standing there.’}
\]

¹⁰ In the standard IL conception, the intension of a concept is actually a set of attributes. All empirical analyses in this framework which I am aware of, however, take these sets to be singletons. We can therefore safely identify the intension of a concept with its unique element (cf. also Nolda 2012: sect. 4.3.3).


¹² The denotatum is not to be confused with the denotation, or extension, of a concept. Fricke (2007) calls the denotatum “the intended reference object”. The term “referent”, however, is better avoided here, as it is debatable whether adverbs are referring expressions.
(The symbol “ˊ” denotes a syntactic rise accent.) Here, the photograph provides a two-dimensional deictic space. The location on the photograph pointed at during the utterance of da is interpreted by the speaker as a sign for a location in physical space, occupied by the speaker’s brother at the time the photograph was taken. As a consequence, the denotatum belongs to a different space than the demonstratum designating it.

Example (9) illustrates a special case of deixis in the sign space:

(9) Im Deutschen ist er sehr gut, aber leider nicht in Mathematik. Da sind seine Leistungen nur mittelmäßig.

‘He is very good at German, but unfortunately not at mathematics. There, his results are only average.’

In a normal utterance of (9), the demonstratum is a location in a textual deictic space: the utterance part in Mathematik.¹³ The demonstratum, in turn, is interpreted as a sign for a non-textual denotatum – roughly, a circumstance like ‘with respect to mathematics’. Such a use of $da^W_1$ gives rise to metadeixis in the sign space, or text phorics, in the sense of Fricke (2007).¹⁴

Entities designated by textual demonstrata in the text-phorics use of $da^W_1$ must, as a rule, be compatible with the syntactic functions of an adverb and their possible interpretations; they include, for example, locations, times, circumstances, and states-of-affairs, but exclude individuals. These restrictions do not apply when $da^W_1$ does not provide a syntactic constituent, but a word-formation basis, such as in the formation of prepositional adverbs (see Section 4 below).

3 The prepositional bases

As mentioned in Section 1, there are at least eleven members of the lexicological word unter$^W_{1\ldots11}$ which function as prepositional bases for the formation of the members of darunter$^W_{1\ldots11}$. The meanings of these prepositions unter$^W_{1\ldots11}$ are exemplified below:

1. unter$^W_1$ with the meaning ‘below a location (static)’ (below-loc$^\text{stat}$, for short):

(10) Zwei Meter unter der Decke hing eine Lampe.
    ‘Two metres below the ceiling, there was hanging a lamp.

¹³ Normally, textual demonstrata are contained in the actual utterance context. They may, however, also be part of a textual space which is only understood. The same applies to other sign spaces as well (for an example of an imaginary demonstratum, cf. Fricke 2007: 129).

¹⁴ Cases like (8) are called “object deixis in the sign space” by Fricke (2007). Fricke also distinguishes between object deixis in the non-sign space, as in Example (7B), and metadeixis in the non-sign space, like the use of unten in an utterance of siehe unten (‘see below’) for a certain textual location.
2. $unter^2_W$ with the meaning ‘below a location (dynamic)’ (below-loc$_{dyn}$):

(11) \textit{Er hängte die Lampe zwei Meter unter die Decke.}  
\textit{He hung the lamp two metres below the ceiling.}

3. $unter^3_W$ with the meaning ‘below a degree (static)’ (below-deg$_{stat}$):

(12) \textit{Nachts kann die Temperatur auch einige Grad unter Null liegen.}  
\textit{At night, the temperature can even be a few degrees below zero.}

4. $unter^4_W$ with the meaning ‘below a degree (dynamic)’ (below-deg$_{dyn}$):

(13) \textit{Nachts kann die Temperatur auch einige Grad unter Null sinken.}  
\textit{At night, the temperature can even fall a few degrees below zero.}

5. $unter^5_W$ with the meaning ‘identifiable by a linguistic or conceptual unit (static)’ (ident-by-lcu$_{stat}$):

(14) \textit{Unter dem Namen Non-Food-Produkte laufen alle Artikel, die man nicht essen kann.}  
\textit{All articles which one cannot eat go by the name of non-food products.}

6. $unter^6_W$ with the meaning ‘identifiable by a linguistic or conceptual unit (dynamic)’ (ident-by-lcu$_{dyn}$):

(15) \textit{Man könnte Vertriebsrecht unter die Kategorie „Wirtschaftsrecht“ einordnen.}  
\textit{One could file distribution law under the category “business law”.}

7. $unter^7_W$ with the meaning ‘under a location (static)’ (under-loc$_{stat}$):

(16) \textit{Unter seinem Pullover spürte er ihre Hand.}  
\textit{He sensed her hand under his sweater.}

8. $unter^8_W$ with the meaning ‘under a location (dynamic)’ (under-loc$_{dyn}$):

(17) \textit{Sie schob ihre Hand unter seinen Pullover.}  
\textit{She put her hand under his sweater.}
9. unter\(^W\)_\(9\) with the meaning ‘caused by a burdening state of affairs’ (caused-by-a-burdening-soa):

\[(18)\]  
\begin{align*}
\text{Sie} \ & \text{litt} \ & \text{sehr} \ & \text{unter} \ & \text{der} \ & \text{Hitze}. \\
\text{she} \ & \text{suffered} \ & \text{very} \ & \text{caused-by-a-burdening-soa} \ & \text{the.DAT} \ & \text{heat} \\
\text{‘She suffered a lot from the heat.’}
\end{align*}

10. unter\(^W\)_\(10\) with the meaning ‘among a multitude (static)’ (among-mult\(_{\text{stat}}\)):

\[(19)\]  
\begin{align*}
\text{Unter} \ & \text{dem} \ & \text{Mais} \ & \text{waren} \ & \text{auch} \ & \text{ein paar Erbsen}. \\
\text{among-mult}_{\text{stat}} \ & \text{the.DAT} \ & \text{maize} \ & \text{were} \ & \text{also} \ & \text{some} \ & \text{peas} \\
\text{‘There were also some peas among the maize.’}
\end{align*}

11. unter\(^W\)_\(11\) with the meaning ‘among a multitude (dynamic)’ (among-mult\(_{\text{dyn}}\)):

\[(20)\]  
\begin{align*}
\text{Sie} \ & \text{mischte} \ & \text{noch} \ & \text{ein paar Erbsen unter} \ & \text{den} \ & \text{Mais}. \\
\text{she} \ & \text{mixed} \ & \text{in.addition some peas} \ & \text{among-mult}_{\text{dyn}} \ & \text{the.ACC} \ & \text{maize} \\
\text{‘She also mixed some peas among the maize.’}
\end{align*}

As can be seen from this list, I take a polysemy approach to the problem of so-called ‘two-way prepositions’ (‘Wechselpräpositionen’) with alternating dative/accusative case government and corresponding static and dynamic readings. Instead of assuming, for instance, two lexical words unter\(^W\)_\(1\) and unter\(^W\)_\(2\) with the lexical meanings ‘below a location (static)’ and ‘below a location (dynamic)’, one could, in principle, also assume a single lexical word, either with the meaning ‘below a location (static)’ or with an underspecified meaning ‘below a location’. In the first case, the dynamic reading would be derived from the static meaning in syntactic semantics by interpreting the accusative case of its complement accordingly. In the second case, both readings would be derived from the underspecified lexical meaning in syntactic semantics (or perhaps only in pragmatics).

Although an approach which takes the ambiguity between static and dynamic readings of ‘two-way prepositions’ to be a matter of syntactic semantics (or pragmatics) might be preferable on economic grounds, it is, in my view, empirically ill-founded for prepositions in Modern German. Such an approach predicts that a preposition with a logically appropriate lexical meaning can be interpreted both statically and dynamically, according to the dative or accusative case of its complement. In non-dialectal Modern German, however, the preposition bei can only be interpreted statically:

\[(21)\]  
\begin{align*}
a. \text{Sie} \ & \text{stand bei der} \ & \text{Latern}. \\
\text{she} \ & \text{stood at} \ & \text{the.DAT} \ & \text{street.lamp} \\
\text{‘She stood at the street lamp.’}
\end{align*}

\[b. * \text{Sie ging bei die} \ & \text{Latern}. \\
\text{she went at} \ & \text{the.ACC} \ & \text{street.lamp}
\]

Obviously, there is no logical reason why a dynamic interpretation of bei is excluded. As a matter of fact, bei happened to be a ‘two-way preposition’, with both static and dynamic readings, in earlier stages of German (cf. Paul 1916–1920: vol. 4, 29 f.) and still is in certain dialectal varieties (cf. Fleischer 2002: 55).

Now, one could argue that the unavailability of a dynamic interpretation of bei in Modern German is an epiphenomenon of its case government: governing the dative but not the accusative, bei must be statically interpreted. This argument, however, does not carry over to prepositions like zu which also govern dative case despite their exclusively dynamic interpretation:

\[(22)\]  
\begin{align*}
\text{Sie} \ & \text{ging zu der} \ & / * \text{die} \ & \text{Latern}. \\
\text{she} \ & \text{went to} \ & \text{the.DAT} \ & \text{the.ACC} \ & \text{street.lamp} \\
\text{‘She went to the street lamp.’}
\end{align*}
Thus, there appears to be no uniform, general correlation between readings and case government of prepositions in Modern German. Any attempt to derive static or dynamic interpretations from case governing breaks down when it comes to coping with the interpretation of prepositional adverbs, whose valence is lexically reduced by the corresponding place. Although most Modern German prepositional adverbs formed from ‘two-way prepositions’ have both static and dynamic readings, darin has only a static one:

\[(23)\]  
a. Der Schlüssel ist im Schloss stecken geblieben.  
the key is in the lock got.stuck  
‘The key got stuck in the lock.’  
b. Der Schlüssel ist darin stecken geblieben.  
the key is in there got.stuck  
‘The key got stuck in it.’

\[(24)\]  
a. Sie steckte den Schlüssel ins Schloss.  
she put the key in the lock  
‘She put the key in the lock.’  
b. *Sie steckte den Schlüssel darin.  
she put the key in there

Again, there is no logical reason for the exclusion of the dynamic reading of darin. Rather, it appears to be blocked by the coexistence of the dynamic variant darein, formed from dynamic ein, which, however, no longer exists as a free preposition.¹⁵

None of these empirical problems arise in a polysemy approach. In such an approach, the availability of static and/or dynamic readings of prepositions and prepositional adverbs alike is lexically determined through their lexical meanings. The case government of prepositions is also specified in the lexicon (in the IL framework in terms of syntactic government categories; cf. Lieb 1993: 448). Generalisations about semantic and syntactic correlations between static and dynamic preposition variants can then be stated as empirical hypotheses on the existence (or, for that matter, non-existence) of relevant preposition pairs, while hypotheses on the (non)existence of static and dynamic variants of prepositional adverbs involve word formation instead of syntax. Since static and dynamic variants are formally and semantically related (see Section 3.2 below), they are, in addition, members of the same lexicological words. In fact, I shall show below that all of the prepositions unter\textsubscript{LW} to unter\textsubscript{H} belong to a single lexicological word, unter\textsubscript{LW}. I shall now discuss the lexical meaning of each of these prepositions in turn.

3.1 ‘Below a location (static)’

The local preposition unter\textsubscript{LW} has the lexical meaning ‘below a location (static)’. Its intension is an attribute to be called “BELOW-LOC\textsubscript{stat}.” This attribute can be defined as follows:

¹⁵Krause (2007: 464, n. 47) argues that in Modern German, there is no prepositional adverb darein, but only a more or less synonymous adverb group da rein (orthographically also rendered as darein). In da rein, two independent adverbs co-occur, both with their own primary lexical accent: da and rein, the latter being an origo-neutral variant of the directional deictic adverbs herein and hinein. Whether or not darein still exists as a prepositional adverb in Modern German is irrelevant for the problem under discussion here.
\[(25) \quad \text{BELOW-LOC}_{\text{stat}} = _{\text{def}} (\lambda x_1 x_2 x_3) (\exists x_4) (\exists x_5) \]
\[x_4 \text{ is a space with a vertical dimension } \land \]
\[x_1 \text{ and } x_2 \text{ are locations in } x_4 \land \]
\[x_5 \text{ is an appropriate distance scale for } x_4 \land \]
\[x_3 \text{ is a positive degree on } x_5 \land \]
\[\text{the position of } x_1 \text{ in the vertical dimension of } x_4 \]
\[\text{is less than the position of } x_2 \text{ by } x_3.\]

In other words, BELOW-LOC_{\text{stat}} is a three-place intensional relation between two locations \(x_1\) and \(x_2\) in a space \(x_4\) with a vertical dimension and a positive (non-zero and non-negative) degree \(x_3\) on an appropriate distance scale \(x_5\) for \(x_4\) such that \(x_1\) is lower than \(x_2\) by \(x_3\). Here, \(x_1\) functions as the denotatum, \(x_2\) as the relatum, and \(x_3\) as the extent; the variables \("x_1", "x_2", and "x_3"\) themselves will be referred to as “the denotatum argument”, “the relatum argument”, and “the extent argument”, respectively.¹⁶

The space \(x_4\) typically is three-dimensional physical space, and \(x_5\) a length scale such as metre or foot. Other spaces, however, may also have an intrinsic vertical dimension.¹⁷ Geographical space, for example, which usually is represented by a map or by the surface of a globe, has a vertical dimension which is determined by its north–south axis (cf. Klein 1991: 79). Distances in geographical space are not only measured by length scales, but also by degree scales like the latitude difference between two locations:

\[(26) \quad \text{Der Archeipel liegt 2 Grad unter dem Äquator vor Kenyas Küste [...]}. \]
\[\text{the archipelago lies two degree below-loc}_{\text{stat}} \text{ the.DAT equator in.front.of Kenya's coast} \]
\[\text{‘The archipelago is located two degrees below the equator off the coast of Kenya.’} \]

Texts, which are written in some way or another ‘from top to bottom’, thereby also have an intrinsic vertical dimension. Distances in texts are typically measured in terms of sentences, paragraphs, and the like.

According to (25), the vertical position of the denotatum is less than the vertical position of the relatum by a positive extent. This leaves it open whether or not the denotatum and the relatum are actually vertically aligned. Vertical non-alignment has to be allowed for cases like (27):

\[(27) \quad \text{die Hütte unter dem Gipfel} \]
\[\text{the hut below-loc}_{\text{stat}} \text{ the.DAT peak} \]
\[\text{‘the hut below the peak’} \]

An utterance of (27) does not imply that the location of the entity referred to by \(\text{die Hütte}\) is ‘directly below’ the location of the referent of \(\text{dem Gipfel}\). Rather, the denotatum may be anywhere below the relatum, provided that it is in a contextually relevant neighbourhood region of the latter. In the view taken here, such contextual restrictions of the relation between the denotatum and the relatum are not a matter of lexical semantics, but of syntactic semantics or pragmatics. In IL, they can be accounted for in syntactic semantics by means of contextualised attributes (to be introduced in Section 4.1 below).

¹⁶ Note that the relatum variable in (25) is not bound by an existential quantifier, but by a lambda operator, which is compatible with both definite and non-definite interpretations of the relatum in syntactic semantics – irrespective of the paraphrase “below a location (static)” of the lexical meaning of \(\text{unter}\) with an indefinite article.

¹⁷ There is a general consensus that the vertical dimension can be determined without reference to an origo (or ‘viewpoint’ in the sense of Klabunde 2000: 196), in contrast to the front–back and the left–right dimensions, which are crucial for the interpretation of words like \(\text{vor}\) (‘in front of a location’) and \(\text{links}\) (‘left of a location’) (cf. the discussion in Lang 1991: 132–144). In my view, concepts like ‘in front of a location’, ‘left of a location’, etc. should be conceived as deictic ones, in the sense of involving an origo.
It is a matter of debate whether the lexical meanings of local prepositions should relate locations or, rather, the entities occupying those locations. Klein (1991: 102 f.) argues that the latter approach does not easily generalise from adnominal to adverbial constructions with spatial expressions like those in (28):

   a fork missed on the table
   ‘A fork was missing on the table.’
 b. *Es war sehr kalt draußen.* (Klein 1991: 102)
   it was very cold outside
   ‘It was very cold outside.’

In (28a), there are no entities other than locations that could function as the denotatum of the preposition meaning, and in (28b), the adverb meaning involves no such denotatum or relatum either. By contrast, the former alternative, Klein claims, allows for a unified treatment of constructions with spatial expressions. The specification in (25) of the intension of unterW’s lexical meaning follows Klein in this respect. In order to properly relate its relatum argument to the interpretation of a corresponding nominal complement, I shall assume an accommodating relation LOC, which is defined as follows:¹⁸

(29) LOC(x₁, x₂) \[\text{def} \begin{cases} 
(x₂ \text{ is a location } \land x₁ = x₂) \lor \\
(x₂ \text{ is not a location } \land x₂ \text{ has a location } \land x₁ \text{ is a location of } x₂) 
\end{cases} \]

This accommodating relation is used to build conjunctive intensional relations like (30) from (25) in syntactic semantics:¹⁹

(30) \((\lambda x₁, x₂, x₃) (\exists x₁') \text{BELOW-LOC}\_\text{stat} (x₁', x₂, x₃) \land \text{LOC}(x₁', x₂)\)

The LOC relation is also used for properly relating the denotatum argument of BELOW-LOC\_\text{stat} to the interpretation of nominal constituents which are modified by groups headed by a form of unterW.²⁰

The extent x₃ of BELOW-LOC\_\text{stat}, a degree on a distance scale, gives the difference between the vertical positions of the relatum and the denotatum, abstracting away from their horizontal positions. As a consequence, it coincides with the actual distance between the relatum and the denotatum only if both are vertically aligned. In (31), for example, the extent argument is expressed by the measure expression *hundert Meter* and specifies the degree by which the vertical position of the hut’s location is lower than the vertical position of the peak’s location:²¹

---
¹⁸ Cf. Bierwisch’s (1988: sect. 2.1) one-place function loc, which achieves a similar effect. The locations x₂ which LOC relates to x₁ can be contextually restricted in syntactic semantics by a corresponding contextualised attribute in the sense of Section 4.1 below.

¹⁹ In (30) and below, I use the names of attributes autologically as logical predicates, to be interpreted in the following way:
   (i) Let P be an n-place attribute, with n ≥ 1.
        \[P(x₁, \ldots, x_n) \leftrightarrow (x₁, \ldots, x_n) \text{ has } P.\]
   Note that (30) presupposes an appropriate capture-avoiding substitution of variables.

²⁰ Spatial entities can, in principle, occupy different locations at different times. Time-relativity is not specific to local properties, though; cf.: *Der Kranke ist wieder gesund* (‘The ill person has recovered’). Such effects can be accounted for by relativising syntactic meanings to times where appropriate. I abstract away from this complication here.

²¹ There may be different conventions for measuring the extent between vertical positions of locations, depending on the nature of the entities occupying those locations. Regarding the example of a hut below a peak, the extent between the vertical positions of their locations is by convention measured by reference to the ground of the hut (otherwise the
Unless the hut is ‘directly under’ the peak, the actual distance between both locations is larger than that extent.\textsuperscript{22}

Measure expressions like \emph{hundert Meter} in (31) or \emph{zwei Meter} in (10) are analysed here as an additional, optional, complement of \emph{unter}. Such an analysis of measure expressions (also considered by Bierwisch 1988: 3 f., 48 f. on the analogy of dimensional adjectives)\textsuperscript{23} is by no means conceptually necessary — and indeed is rejected by authors such as Zifonun \emph{et al.} (1997: vol. 3, 2090–2095). Empirically, however, it predicts that the preposition meaning determines the way in which the extent denoted by a measure expression is related to the denotatum and the relatum, a prediction which is in fact borne out. This will become clear when we consider further preposition meanings below.

### 3.2 ‘Below a location (dynamic)’

I now turn to ‘below a location (dynamic)’, which is the lexical meaning of \emph{unter}\textsuperscript{\textsc{W}}\textsuperscript{1}, the dynamic variant of \emph{unter}\textsuperscript{\textsc{W}}\textsuperscript{2}. The intension of this meaning, the attribute \textsc{BELOW-LOC}\textsc{\textsc{stat}} in the following way:\textsuperscript{24}

\begin{equation}
\text{BELOW-LOC}_{\text{\textsc{stat}}} = \text{def}\ (\lambda x_1.x_2.x_3)\left(x_1 \text{ is a path } \land \text{BELOW-LOC}_{\text{\textsc{stat}}} (\text{fin}(x_1),x_2,x_3)\right)
\end{equation}

Put differently, \textsc{BELOW-LOC}\textsc{\textsc{dyn}} is a three-place intensional relation between a path \(x_1\) (the denotatum), a location \(x_2\) (the relatum) in an understood space \(x_4\) with a vertical dimension, and a positive degree \(x_3\) (the extent) on an appropriate distance scale for \(x_4\) such that the final part of \(x_1\) (denoted by “\text{fin}(x_1)” in (32)) is a location in \(x_4\) which is lower than \(x_2\) by \(x_3\). A path is taken here to be a – temporal or atemporal – sequence of locations or other entities in a certain configuration,\textsuperscript{25} such as the sequence of the locations passed through a diving event:

\begin{quote}
 extent would be a function of the hut’s height). In the case of a lamp hanging below a ceiling, however, it is typically measured from the top of the lamp to the bottom of the ceiling. In my view, contextual dependencies of this sort are not a matter of lexical semantics, but of syntactic semantics or pragmatics. In IL, they may be accounted for in syntactic semantics by contextualised attributes (cf. Section 4.1 below).
\end{quote}

\textsuperscript{22} An anonymous reviewer noted that in English, \emph{the cabin one hundred metres below the peak} can mean ‘the hut one hundred metres along the trail down from the peak’, the extent argument specifying “the actual distance between the relatum and the denotatum even when the two are not vertically aligned”. In the German examples I have been able to find, this appears not to be the case, cf.:

\begin{quote}
(i) \textit{Als Bergsteiger schaffte er 2011 am Putha Hiunchuli in Nepal mit 7150 Metern seine persönliche Rekordhöhe, musste aber hundert Meter unter dem Gipfel umkehren.} (\textit{S1})
\end{quote}

\textit{As a mountaineer he achieved his personal height record – 7150 metres – on Putha Hiunchuli in 2011, but had to turn back one hundred metres below the peak.}

\textit{Putha Hiunchuli is 7246 metres high.}

\textsuperscript{23} Bierwisch (1988: 49) ultimately rejects the inclusion of extent arguments in the lexical meaning of a preposition like \emph{unter} for two reasons: the problem of the proper correspondence between static and dynamic meanings (cf. Note 38 in Section 3.8 below), and the problem of excluding the co-occurrence of measure expressions with preposition modifiers like \textit{weit} (‘far’).

\textsuperscript{24} For the autological use of the attribute name “\textsc{BELOW-LOC}\textsc{\textsc{stat}}” as a logical predicate in (32), cf. Note 19.

\textsuperscript{25} Cf. Bierwisch (1988: sect. 2.4) for a formalisation of paths and of the \textit{fin} function from paths to their final part.
As in the case of the static variant, the measure expression specifies the difference between two vertical positions; in the example under discussion, it is the degree by which the final part of the path described by the diving event is lower than the vertical position of the water surface.

In Section 1, it was stated that two lexical words are formally related if their paradigms overlap, and semantically related if there is a semantic relation such as metonymy or metaphor between their lexical meanings. The paradigms of $\text{unter}_1^W$ and $\text{unter}_2^W$ overlap at their common form $\text{unter}$. They are semantically related through metonymy: there is a part–whole relation between the final part of a path and the path itself. The semantic relation between the two prepositions is a ‘regular’ one (a case of ‘rule-based polysemy’ in the sense of Blank 2003: 285 f.), which allows for defining $\text{BELOW-LOC}_{\text{stat}}$, the intension of the lexical meaning of $\text{unter}_2^W$, in terms of $\text{BELOW-LOC}_{\text{stat}}$, the intension of the lexical meaning of $\text{unter}_1^W$, as in (32) above. Given the formal and semantic relatedness of these lexical words, both are to be included in the same lexicological word, viz. $\text{unter}^W$.

### 3.3 ‘Below a degree (static)’

The next preposition meaning to be considered is ‘below a degree (static)’, the lexical meaning of $\text{unter}_3^W$. Its intension may be defined as in (34):

\[
\text{BELOW-DEG}_{\text{stat}} = \text{def} (\lambda x_1 x_2 x_3) (\exists x_4) \begin{cases} 
    x_4 \text{ is a scale} & \\
    x_1 \text{ and } x_2 \text{ are degrees on } x_4 & \\
    x_3 \text{ is a positive degree on } x_4 & \\
    x_1 \text{ is less than } x_2 \text{ by } x_3 
\end{cases}
\]

Like $\text{BELOW-LOC}_{\text{stat}}$, $\text{BELOW-DEG}_{\text{stat}}$ is a three-place intensional relation between two entities $x_1$ and $x_2$ and a positive degree $x_3$. In contrast to $\text{BELOW-LOC}_{\text{stat}}$, $x_1$ and $x_2$ are not locations in a space with a vertical dimension, but (positive or negative) degrees on the same scale as $x_3$ such that $x_1$ is less than $x_2$ by $x_3$. In (12), for example, $x_1$, $x_2$, and $x_3$ are degrees on a temperature scale (presumably, the Celsius scale), and $x_1$ is less than $x_2$ (0 °C) by $x_3$ (some positive degrees Celsius).

Due to its formal and semantic relatedness to $\text{unter}_1^W$, $\text{unter}_3^W$ is another member of the lexicological word $\text{unter}^W$. Formally, the paradigms of the two lexical words are identical and thus trivially overlap. Semantically, their lexical meanings can be related through metaphor. Temperature degrees, for instance, are traditionally measured by means of a liquid-in-glass thermometer, which may

---

26 If one analysed preposition–article contractions like *unter* as preposition forms, as Hinrichs (1986) does, and included *unter* as a dative singular masculine/neuter form in the paradigm of the dative case governing preposition $\text{unter}_1^W$ and *unterm* as an accusative singular neuter form in the paradigm of the accusative case governing preposition $\text{unter}_2^W$, then the paradigms of $\text{unter}_1^W$ and $\text{unter}_2^W$ would still overlap at the categorially unspecified preposition form *unter*.

27 The definens in (32) may be determined in lexical semantics by means of an operation which takes attributes like $\text{BELOW-LOC}_{\text{stat}}$ as arguments. This operation, to be called “DYN” here, is easily defined as follows:

\[\text{DYN}(P) = \text{def} (\lambda x_1 \ldots x_n) (x_1 \text{ is a path} \land P(\text{fin}(x_1), \ldots, x_n))\]

Of course, not only $\text{BELOW-LOC}_{\text{stat}}$ can be built from $\text{BELOW-LOC}_{\text{stat}}$ by DYN, but also the intensions of the lexical meanings of the dynamic variants to be discussed below.

28 This also holds if the contracted form *untterm* is included in the paradigms of $\text{unter}_1^W$ and $\text{unter}_3^W$, which both govern dative case (cf. Note 26 above).
be conceived as a one-dimensional space with an intrinsic vertical dimension. If so, then the locations of the degree marks on the thermometer are ordered by \textsc{below-loc}_\textsc{stat} (the intension of the lexical meaning of \textit{unter}_W^1) in the same way as the degrees themselves are ordered by \textsc{below-deg}_\textsc{stat} (the intension of the lexical meaning of \textit{unter}_W^3). Nevertheless, this kind of semantic relation is not a ‘regular’ one: there is no obvious way in which to define \textsc{below-deg}_\textsc{stat} in a general way in terms of \textsc{below-loc}_\textsc{stat}. Rather, this is an ‘idiosyncratic’ semantic relation (or ‘idiosyncratic polysemy’ in the sense of Blank 2003: 286 f.).

### 3.4 ‘Below a degree (dynamic)’

The dynamic variant of \textit{unter}_W^3 is \textit{unter}_W^4. The intension of the latter’s lexical meaning ‘below a degree (dynamic)’ can be built from the intension of the former’s lexical meaning ‘below a degree (static)’ in the same way as in the case of the lexical meanings of \textit{unter}_W^1 and \textit{unter}_W^2:

\[
\textsc{below-deg}_\textsc{dyn} \overset{\text{def}}{=} (\lambda x_1, x_2, x_3. \text{if } x_1 \text{ is a path } \wedge \textsc{below-deg}_\textsc{stat} (\text{fin}(x_1), x_2, x_3))
\]

\textsc{below-deg}_\textsc{dyn} thus is a three-place intensional relation between a path \(x_1\), a degree \(x_2\) on a scale \(x_4\), and a positive degree \(x_3\) on \(x_4\) such that the final part of \(x_1\) is a degree on \(x_4\) which is less than \(x_2\) by \(x_3\). Accordingly, the path \(x_1\) consists itself of degrees.

It is obvious that \textit{unter}_W^4 is formally and semantically related to \textit{unter}_W^3 in the same way as \textit{unter}_W^2 is related to \textit{unter}_W^1 (cf. Section 3.2 above). In particular, there is the same kind of semantic relation between them, which allows for defining \textsc{below-deg}_\textsc{dyn} in terms of \textsc{below-deg}_\textsc{stat}. Therefore, \textit{unter}_W^4 is a member of the same lexicological word as \textit{unter}_W^3 and – by transitivity – \textit{unter}_W^1 and \textit{unter}_W^2.

### 3.5 ‘Identifiable by a linguistic or conceptual unit (static)’

Next, I shall discuss \textit{unter}_W^5, which is used in (14) as the head of a prepositional object of \textit{laufen}, meaning ‘go by the name of’ here. Such preposition occurrences are known as \textit{governed prepositions}. In the literature, it has been suggested that governed prepositions have no meaning at all (Heringer 1968: 434 f. is an early reference for this) or only a trivial lexical meaning, like the two-place concept ‘identical with’ (Lieb 2011: 264; Budde 2014: 344). Lerot (1982: 267 f.), however, cites numerous examples of governed prepositions which have the same meaning as their non-governed

\[\text{(S7)}\]

‘If the height is below two metres …’

The preposition \textit{unter}_W^3 is also closely related to the ‘adnumeral’ \textit{unter} in the sense of Plank (2004):

\[\text{(i)}\]

\textit{unter} \text{ zwei Meter hoch}

‘less than two metres high’

\textit{unter} does not govern case. This distinguishes the ‘adnumeral’ from the preposition, which governs dative case:

\[\text{(ii) Liegt die Höhe unter zwei Metern [...].}\]

‘lies the height below-deg\text{stat} two\text{ metres}\text{ dat}\’

The existence of a dynamic variant of \textit{unter}_W^3 was pointed out to me by Monika Budde.

In the valence dictionary of Schumacher \textit{et al.} (2004: 516), the \textit{laufen} variant under discussion corresponds to the sub-lemma ‘\textit{laufen 12}’, with the government category ‘NomE PräpE’ (nominative complement and prepositional complement).
counterparts. A similar case can be made for \( \text{unter}^W_5 \); in (36), for example, it occurs as the head of a predicative modifier:

(36) \( \text{[...] jetzt kommt sie unter dem Namen „Clever“ auch nach Deutschland.} \) (S11)

‘Now it is also coming to Germany under the name of “Clever”.’

Still, the meaning of the non-governed \( \text{unter} \) in (36) does not differ from the meaning of the governed \( \text{unter} \) in (14): in both preposition groups, the meaning of \( \text{unter} \) relates some linguistic or conceptual unit (here: a name) to entities which can be identified by that unit.

I therefore suggest that the lexical meaning of \( \text{unter}^W_5 \) has the intension defined in (37):

(37) \( \text{IDENT-BY-LCU}^\text{stat} = \text{def} (\lambda x_1 x_2) \left( x_2 \text{ is a linguistic or conceptual unit} \land x_2 \text{ can identify } x_1 \right) \)

IDENT-BY-LCU\text{stat} is a two-place intensional relation between a sortally unrestricted entity \( x_1 \) and a linguistic or conceptual unit \( x_2 \) such that the former can be identified by the latter. This relation holds, for instance, between a product \( x_1 \) and its name \( x_2 \), a dictionary entry \( x_1 \) and its lemma \( x_2 \), or a book \( x_1 \) and its title \( x_2 \). Note that this identification relation abstracts away from any distance between, say, a title page and the rest of a book. Accordingly, there is no extent argument involved in IDENT-BY-LCU\text{stat}.

In this meaning, \( \text{unter}^W_5 \) may be related to \( \text{unter}^W_1 \) through metaphor. A written text, for instance, is space with an intrinsic vertical dimension (cf. Section 3.1 above), where a title or a heading provides a linguistic or conceptual unit which can identify the text part below it.\(^{32}\) Since \( \text{unter}^W_5 \) is not only semantically, but also formally, related to \( \text{unter}^W_1 \), too, it is a member of \( \text{unter}^\text{LW}_5 \).

3.6 ‘Identifiable by a linguistic or conceptual unit (dynamic)’

\( \text{unter}^W_5 \) also has a dynamic variant: \( \text{unter}^W_6 \) with the lexical meaning ‘identifiable by a linguistic or conceptual unit (dynamic)’.\(^{33}\) Its intension IDENT-BY-LCU\text{dyn} is built from IDENT-BY-LCU\text{stat} in the same way as in the case of the dynamic variants discussed above:

(38) \( \text{IDENT-BY-LCU}^\text{dyn} = \text{def} (\lambda x_1 x_2) \left( x_1 \text{ is a path} \land \text{IDENT-BY-LCU}^\text{stat} (\text{fin} (x_1), x_2) \right) \)

IDENT-BY-LCU\text{dyn} thus is a two-place intensional relation between a path \( x_1 \) and a linguistic or conceptual unit \( x_2 \) such that the final part of \( x_1 \) can be identified by \( x_2 \). In Example (15), \( x_1 \) might be a path of abstract locations in conceptual space into the class of subconcepts of the concept ‘business law’, the latter functioning as an identificatory ‘category label’ for the former.

The formal and semantic relatedness of \( \text{unter}^W_6 \) and \( \text{unter}^W_5 \) parallels that of \( \text{unter}^W_2 \) and \( \text{unter}^W_1 \), or \( \text{unter}^W_4 \) and \( \text{unter}^W_3 \). Thus, \( \text{unter}^W_6 \) is also to be included in the lexicological word \( \text{unter}^{\text{LW}} \).

3.7 ‘Under a location (static)’

I now come to the local preposition \( \text{unter}^W_7 \) and its lexical meaning ‘under a location (static)’. In contrast to the preposition meanings discussed above, this is not a dimensional concept, but a to-
polological one, which does not involve spatial dimensions (for this distinction, cf. Wunderlich and Herweg 1991: 776–780). The intension of this concept can be defined as follows:\(^{34}\)

\[
\begin{align*}
\text{(39) } \text{UNDER-LOC}_{\text{stat}} &= \text{def } (\exists x_1 \exists x_2 \exists x_3 \exists x_4 \exists x_5) \\
& (x_4 \text{ is a space } \land \\
& x_3 \text{ and } x_2 \text{ are locations in } x_4 \land \\
& x_5 \text{ is an appropriate distance scale for } x_4 \land \\
& x_3 \text{ is a positive degree on } x_5 \land \\
& \text{the intrinsic underside of } x_2 \text{ covers } x_1 \text{ by } x_3)
\end{align*}
\]

Thus, \(\text{UNDER-LOC}_{\text{stat}}\) is a three-place intensional relation between two locations \(x_1\) and \(x_2\) in a space \(x_4\) and a positive degree \(x_3\) on an appropriate distance scale for \(x_4\) such that the intrinsic underside of \(x_2\) covers \(x_1\) by \(x_3\). Since no dimension is presupposed, the denotatum \(x_1\) need not be below the relatum \(x_2\).\(^{35}\)

The extent argument “\(x_3\)” specifies the degree by which the denotatum is covered by the intrinsic underside of the relatum, cf.:

\[
\begin{align*}
\text{(40) } \text{Das Fahrzeug kam [...] zwei Meter unter dem Lkw zum Stillstand.} & \quad (S 4) \\
\text{the vehicle came two metres under-loc}_{\text{stat}} \text{ the.dat lorry to.a.standstill} \\
\text{‘The vehicle came to rest two metres under the lorry.’}
\end{align*}
\]

Here, the path described by the event of ‘coming to a standstill’ provides a suitable ad-hoc dimension for determining the degree by which the vehicle is covered by the underside of the lorry (cf. also Wunderlich and Herweg 1991: 780). This might suggest that \(\text{zwei Meter in (40)}\) is not a preposition complement, but a verb modifier. Syntactically, however, \(\text{zwei Meter unter dem Lkw}\) behaves as a single constituent, which can occupy the prefield:

\[
\begin{align*}
\text{(41) } \text{Zwei Meter unter dem Lkw kam das Fahrzeug zum Stillstand.} & \quad \text{two metres under-loc}_{\text{stat}} \text{ the.dat lorry came the vehicle to.a.standstill}
\end{align*}
\]

I therefore provisionally analyse the measure expression here in the same way as a measure expression co-occurring with the prepositions discussed above – viz. as an additional, optional, complement of the preposition.

As a matter of fact, \(\text{unter in (40)}\) is ambiguous between a \(\text{UNDER-LOC}_{\text{stat}}\) reading and a \(\text{BELOW-LOC}_{\text{stat}}\) reading.\(^{36}\) In the latter reading, the vehicle came to rest two metres vertically below the lorry. Here, the extent argument does not specify the degree by which the denotatum is covered by the underside of the relatum, but the difference between their vertical positions. These different interpretations of the measure expression are predicted by the lexical ambiguity approach taken here, while I do not see how to obtain them in an approach trying to derive these readings from a common lexical meaning.

Still, it is obvious that \(\text{unter}_{\text{1}}^{\text{W}}\) is semantically related to \(\text{unter}_{\text{1}}^{\text{W}}\). This semantic relation is perhaps best seen as one of semantic extension (in a purely synchronic sense, without the diachronic connotation that the more general meaning has actually evolved from the more restricted one).\(^{37}\)

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\(^{34}\) Cf. Krause (1994: 362 f.), who distinguishes, \(\text{inter alia, a meaning of unter in Marcq’s (1988) axis-free System II where the preposition determines ‘la position du participant « recouvert » (par un participant « recouvrant ») [the location of the ‘covered’ participant (by a ‘covering’ participant)]}^\).\(^{35}\)


\(^{36}\) Cf. also Nüse (2007: 29 f.), who shows that \(\text{unter}\) ambiguously locates denotata with respect to relata such as pictures hanging on the wall. Here, the denotatum (say, a stain) may either be vertically below it or between the intrinsic underside of the picture (its backside) and the wall. The former reading corresponds to \(\text{BELOW-LOC}_{\text{stat}}\), while the latter one is an \(\text{UNDER-LOC}_{\text{stat}}\) reading.

\(^{37}\) From a synchronic point of view, we could equally well relate \(\text{unter}_{\text{1}}^{\text{W}}\) to \(\text{unter}_{\text{1}}^{\text{W}}\) through semantic restriction. Either way, this would be a case of ‘taxonomic polysemy’ in the sense of Blank (2003: 269 f.).
the sake of the argument, let us assume that “covering” is understood as ‘hiding from view’ (for discussion, cf. Klein 1991: 100 f.). Then covering involves an implicit perspective from which the underside of a relatum totally or partially hides a denotatum. If that perspective is approximately aligned with the space’s vertical dimension in top–down direction, then the denotatum is not only under the relatum, but also below it; if the perspective is not aligned, then the denotatum is under the relatum, but not below it. In a sense, then, the concept ‘under a location (static)’ is a generalisation of the concept ‘below a location (static)’; the latter involves a specific spatial dimension (the vertical one), while the former does not. Thus, \( \text{unter}^W_7 \) and \( \text{unter}^W_1 \) are not only formally related, but also semantically, through an (‘idiosyncratic’) semantic relation of semantic extension. Since \( \text{unter}^W_7 \) is also formally related to \( \text{unter}^W_1 \), they are members of the same lexicological word.

3.8 ‘Under a location (dynamic)’

The concept ‘under a location (dynamic)’ is the lexical meaning of \( \text{unter}^W_8 \). Its intension is built, as usual, from the intension of the lexical meaning of the static variant, \( \text{unter}^W_7 \):

\[
\text{UNDER-LOC}_{\text{dyn}} = \text{def} \left( \lambda(x_1, x_2, x_3) \left( x_1 \text{ is a path} \land \left( \text{UNDER-LOC}_{\text{stat}} \left( \text{fin}(x_1), x_2, x_3 \right) \right) \right) \right)
\]

In other words, \( \text{UNDER-LOC}_{\text{dyn}} \) is a three-place intensional relation between a path \( x_1 \), a location \( x_2 \) in an understood space \( x_4 \), and a positive degree \( x_3 \) on some appropriate distance scale for \( x_4 \) such that the final part of \( x_1 \) is a location in \( x_4 \), and the underside of \( x_2 \) covers that location by \( x_3 \). In (43), for example, the extent \( x_3 \) is the amount by which the final part of the denotatum – i.e., the final part of the path described by a pushing event – is covered by the underside of the relatum – the underside of a semi-trailer:

\[
\text{(43) Der Kombi wurde rund eineinhalb Meter unter den Sattelanhänger gestoßen} \ldots
\]

‘The estate was pushed under the semi-trailer by about one and a half metres.’

Thus, the way in which the extent is related here to the denotatum and the relatum patterns with the other topological meaning ‘under a location (static)’, but differs from the dimensional preposition meanings.\(^38\)

The preposition \( \text{unter}^W_8 \) is formally and semantically related to \( \text{unter}^W_7 \) in the same way as \( \text{unter}^W_2 \), \( \text{unter}^W_4 \), and \( \text{unter}^W_6 \) are related to their static variants. As a consequence, \( \text{unter}^W_8 \) is another member of \( \text{unter}^{1W} \).

\(^38\) One of the reasons why Bierwisch (1988: 49) ultimately rejects the inclusion of extent arguments in the lexical meaning of prepositions is the problem of the proper correspondence between static and dynamic meanings:

\[
[...] the directional use of P in many cases requires an interpretation of MP [measure phrase; A. N.] that differs from that appropriate for the locational use. Thus 2 Meter unter den Tisch does not generally denote a path that ends 2 meters below the table, but rather a path the final two meters of which are below the table.
\]

(Cf. also Section 3.7 above.) In the analysis presented here, this problem does not arise: all dynamic meanings which involve an extent argument are properly related to a static meaning in the same way, and \textit{vice versa}.
3.9 ‘Caused by a burdening state of affairs’

Unter\textsubscript{W}, the preposition to be considered next, occurs in (18) as the head of a prepositional object.\textsuperscript{39} In Section 3.5, I have shown that unter\textsubscript{W} can be used both as a governed or non-governed preposition. This holds also for unter\textsubscript{9}, which occurs in (44) as the head of an adverbial modifier:

\[(44) \text{Unter dem Druck des Wassers gaben die Mauern nach und stürzten ein.} \]

’Sunder the pressure of the water, the walls gave in and collapsed.’

From the Examples (18) and (44), it appears that unter\textsubscript{W} expresses a relation between a physical or psychological burden and a state or event caused by it.\textsuperscript{40} At first glance, the burden can be identified with the denotatum of the meaning of the preposition complement (such as the heat in (18) or the pressure in (44)). Closer inspection, however, reveals that the preposition complement is actually understood as a state of affairs, which may be accommodated from its literal meaning. Consider the following example:

\[(45) \text{Sie litt unter ihrem Mann.} \]

‘She suffered from her husband.’

Here, it is not the husband who is the direct cause of her suffering but rather her husband’s behaviour (say, his betraying her). This state of affairs can be made explicit in correlate constructions with an infinitival or a clausal constituent:

\[(46) \text{a. Sie litt darunter, dass ihr Mann sie betrog.} \]

‘She suffered from the fact that her husband betrayed her.’

\[(46) \text{b. Sie litt darunter, von ihrem Mann betrogen zu werden.} \]

‘She suffered from being betrayed by her husband.’

(For a discussion of the prepositional adverb occurring here, see Section 4.2 below.)

I therefore assume that unter\textsubscript{W} has the lexical meaning ‘caused by a burdening state of affairs’, the intension of which is given in (47):

\[(47) \text{CAUSED-BY-A-BURDENING-SOA} = \text{def} \ (\lambda x_1, x_2) \left( \begin{array}{l} x_2 \text{ is a state of affairs} \\
\land \ x_2 \text{ is a burden causing } x_1 \end{array} \right) \]

The attribute CAUSED-BY-A-BURDENING-SOA is a two-place intensional relation between an entity \(x_1\) and a state of affairs \(x_2\) such that the latter is a burden causing the former. If causal relations pertain between states of events, then it follows that \(x_1\) is also a state of affairs, such as the state of affairs that someone is in a suffering state or that something undergoes a collapsing event. Note that the attribute CAUSED-BY-A-BURDENING-SOA has no extent argument. This does not come as a surprise: there is no meaningful measure for the relation denoted by this attribute.

\textsuperscript{39} This object is governed by an occurrence of a verb corresponding in Schumacher \textit{et al.} (2004: 522 f.) to the sublemma “leiden 2” and the government category “NomE (PräpE)” (nominative complement and optional prepositional complement).

\textsuperscript{40} The causal nature of this relation was suggested to me by Kerstin Schwabe.
In order to properly relate the relatum argument “x₂” to the interpretation of the corresponding nominal complement – which may, or may not, directly denote a state of affairs – I define an accommodating relation to be called “SOA”:

\[(SOA(x₁, x₂) \leftrightarrow \begin{cases} \text{x₂ is a state of affairs} \land x₁ = x₂ & \lor \\ \text{x₂ is not a state of affairs} \land x₁ \text{ is a state of affairs involving } x₂ \end{cases})\]

By means of SOA, accommodated intensional relations like (49) are built from (47) in syntactic semantics:

\[(\forall x₁, x₂)(\exists x₂') \left\{ \begin{array}{l} \text{CAUSED-BY-A-BURDENING-SOA}(x₁, x₂') \land \\ \text{SOA}(x₂', x₂) \end{array} \right\} \]

In order to be a member of the lexicological word unter\textsuperscript{1W}, unter\textsuperscript{3W} has to be formally and semantically related to another member. In my view, the most closely related lexical word is unter\textsuperscript{1W}. Their formal relatedness is obvious. Semantically, the lexical meaning ‘caused by a burdening state of affairs’ of unter\textsuperscript{3W} may be metaphorically related to the lexical meaning ‘below a location (static)’ of unter\textsuperscript{1W} in the following way. Let us assume that someone is carrying a heavy physical burden. This implies that the former is vertically below the latter. States of affairs of this kind typically cause further states of affairs, such as suffering from the weight of the burden or collapsing under it.

As far as I can see, there is no dynamic variant of unter\textsuperscript{3W}. At any rate, I have not been able to find convincing examples for such a reading.

3.10 ‘Among a multitude (static)’

The concept ‘among a multitude (static)’ is the lexical meaning of unter\textsuperscript{10W}. Its intension is the attribute defined in (50):

\[(\text{AMONG-MULT}_\text{stat} = \text{def} (\lambda x₁, x₂)(x₂ \text{ is a multitude } \land x₂ \text{ encompasses } x₁))\]

This two-place intensional relation holds between a sortally unrestricted entity x₁ and a multitude x₂ encompassing the former. (“Multitude” is used here as a cover term for “mass” and “plurality”.) I could not find any examples where unter\textsuperscript{10W} is used together with a measure expression. So there is no reason to assume an extent argument here.

Now, is there a relevant semantic relation between unter\textsuperscript{10W} and one of the prepositions discussed above? From a diachronic point of view, one might negate this question. As a matter of fact, there happen to be two roots of unter words, one corresponding to Latin infra and another to inter (cf. Paul 1916–1920: vol. 4, 3). Obviously, unter\textsuperscript{10W} belongs to the inter group, while the other prepositions discussed so far fall into the infra group.\(^{41}\) From a synchronic point of view, however, one might semantically relate unter\textsuperscript{10W} to unter\textsuperscript{7W} through semantic extension (also used for relating unter\textsuperscript{7W} to unter\textsuperscript{1W} in Section 3.7 above). An anonymous reviewer suggests the following connection between their lexical meanings: “Roughly speaking, an individual who is among a multitude of objects will often be difficult to see, hence essentially covered by that group of objects […].” Put differently, an entity encompassed by a multitude may be effectively hidden by it as if the multitude covered it. Insofar as covering is a case of hiding from view (cf. Section 3.7 above), the concept ‘among a multitude (static)’ can be seen as a generalisation of the concept ‘under a location (static)’. If so, then unter\textsuperscript{10W} for...

\(^{41}\) It seems to be this very fact which makes Krause (2007: 457, n. 14) believe that unter is the only simple preposition in German with two different signif\'ies.
would be synchronically related to $\text{unter}^W_7$ both formally and semantically despite their different diachronic roots, and $\text{unter}^W_{10}$ would be a member of the lexicological word $\text{unter}^\text{LW}$, too.\footnote{In Blank’s (2003: 277) terminology, this would be a case of ‘secondary polysemy’: “original homonymy is re-interpreted as polysemy by speakers who feel a semantic relation between the two senses in question”.

3.11 ‘Among a multitude (dynamic)’

The preposition $\text{unter}^W_{10}$ also has a dynamic variant: $\text{unter}^W_{11}$. The intension of its lexical meaning ‘among a multitude (dynamic)’ is built in the familiar way:

\[(51) \ \text{AMONG-MULT}^\text{dyn} = \text{def} \left( \lambda x_1.x_2 \left( x_1 \text{ is a path} \land \text{AMONG-MULT}^\text{stat} (\text{fin} (x_1), x_2) \right) \right) \]

Thus, $\text{AMONG-MULT}^\text{dyn}$ is a two-place intensional relation between a path $x_1$ and a multitude $x_2$ such that the latter encompasses the final part of the former.

It should be needless to say that $\text{unter}^W_{11}$ is formally and semantically related to $\text{unter}^W_{10}$ and thereby also a member of $\text{unter}^\text{LW}$.

4 The prepositional adverbs

Having determined the adverbial basis $\text{da}^W$ in Section 2 and the prepositional bases $\text{unter}^W_1$ to $\text{unter}^W_{11}$ in Section 3, I shall now show how to compose from their lexical meanings the meanings of the prepositional adverbs $\text{darunter}^W_1$ to $\text{darunter}^W_{11}$, which are exemplified below:

1. $\text{darunter}^W_1$ with the meaning ‘below a location there (static)’ (below-loc-there$^\text{stat}$):

\[(52) \ \text{Zwei Meter } \text{darunter} \text{ hing eine Lampe.} \]

‘Two metres below, there was hanging a lamp.’

2. $\text{darunter}^W_2$ with the meaning ‘below a location there (dynamic)’ (below-loc-there$^\text{dyn}$):

\[(53) \ \text{Er hängte die Lampe zwei Meter } \text{darunter.} \]

‘He put the lamp two metres below it.’

3. $\text{darunter}^W_3$ with the meaning ‘below a degree there (static)’ (below-deg-there$^\text{stat}$):

\[(54) \ \text{Nachts kann die Temperatur auch einige Grad } \text{darunter liegen.} \]

‘At night, the temperature can even be a few degrees below it.’

4. $\text{darunter}^W_4$ with the meaning ‘below a degree there (dynamic)’ (below-deg-there$^\text{dyn}$):

\[(55) \ \text{Nachts kann die Temperatur […] auch einige Grad } \text{darunter sinken.} \ (S12) \]

‘At night, the temperature can even fall a few degrees below it.’

5. $\text{darunter}^W_5$ with the meaning ‘identifiable by a linguistic or conceptual unit there (static)’ (ident-by-lcu-there$^\text{stat}$):

\[(56) \ \text{(ident-by-lcu-there)} \]

\[(56) \ (\text{S12}) \]

In Blank’s (2003: 277) terminology, this would be a case of ‘secondary polysemy’: “original homonymy is re-interpreted as polysemy by speakers who feel a semantic relation between the two senses in question”.}
(56)  *Non-Food-Produkte, der Name sagt es: darunter laufen alle Artikel, die man nicht essen kann [...]*. (S10)

‘Non-food products – the name speaks for itself: all articles which one cannot eat go by it.’

6. *darunter*\(_W^6\) with the meaning ‘identifiable by a linguistic or conceptual unit there (dynamic)’ (ident-by-lcu-there\(_{\text{dyn}}\)):

(57)  *Falls es eine Kategorie „Wirtschaftsrecht“ gäbe, könnte man Vertriebsrecht sicher ident-by-lcu-there\(_{\text{dyn}}\)* classify Einordnen. (S9)

‘If there were a category “business law”, one could certainly file distribution law under it.’

7. *darunter*\(_W^7\) with the meaning ‘under a location there (static)’ (under-loc-there\(_{\text{stat}}\)):

(58)  *Darunter spürte er ihre Hand.*

‘He sensed her hand under it.’

8. *darunter*\(_W^8\) with the meaning ‘under a location there (dynamic)’ (under-loc-there\(_{\text{dyn}}\)):

(59)  *Sie schob ihre Hand darunter.*

‘She put her hand under it.’

9. *darunter*\(_W^9\) with the meaning ‘caused by a burdening state of affairs there’ (caused-by-a-burdening-soa-there):

(60)  *Sie litt sehr darunter.*

‘She suffered a lot from it.’

10. *darunter*\(_W^{10}\) with the meaning ‘among a multitude there (static)’ (among-mult-there\(_{\text{stat}}\)):

(61)  *Darunter waren auch ein paar Erbsen.*

‘There were also some peas among it.’

11. *darunter*\(_W^{11}\) with the meaning ‘among a multitude there (dynamic)’ (among-mult-there\(_{\text{dyn}}\)):

(62)  *Sie mischte noch ein paar Erbsen darunter.*

‘She also mixed some peas among it.’

As the reader will have noticed, the lexical meanings listed here systematically correspond to the preposition meanings discussed in the previous section. As a consequence, the semantic relations between the former parallel those between the latter. It goes without saying that the lexical words *darunter*\(_W^1\) to *darunter*\(_W^{11}\) are also formally related. I therefore assume that these lexical words are all members of one and the same lexicological word, viz. *darunter*\(_{\text{LW}}\). Instead of going into the lexical meaning of each of them, I shall focus the discussion on the prepositional adverbs *darunter*\(_W^W\), *darunter*\(_W^W\), and *darunter*\(_W^W\), I am confident that the reader will readily generalise the proposed analysis to the rest of them.
4.1 ‘Below a location there (static)’

The intension of the lexical meaning of the prepositional adverb \( \textit{darunter}^\text{W} \), to be called “\( \text{BELOW-LOC-THERE}_{\text{stat}} \)”, is compositionally built from the intension \( \text{THERE} \) of the lexical meaning of the deictic adverb \( \textit{darunter}^\text{W} \) and the intension \( \text{BELOW-LOC}_{\text{stat}} \) of the lexical meaning of the local preposition \( \textit{unter}^\text{W} \)” as follows. The attribute \( \text{BELOW-LOC-THERE}_{\text{stat}} \) inherits the denotatum argument, the relatum argument, and the extent argument from \( \text{BELOW-LOC}_{\text{stat}} \) as well as the deictic places of \( \text{THERE} \), while the denotatum argument of \( \text{THERE} \) is identified with the relatum argument of \( \text{BELOW-LOC}_{\text{stat}} \):^43

\[
(63) \quad \text{BELOW-LOC-THERE}_{\text{stat}} = \text{def} \left( \lambda x_1, x_2, x_3, x_4, x_5 \right) \left( \text{THERE}(x_2, x_4, x_5) \wedge \text{BELOW-LOC}_{\text{stat}}(x_1, x_2, x_3) \right)
\]

(63) amounts to the following. \( \text{BELOW-LOC-THERE}_{\text{stat}} \) is a five-place intensional relation between two locations \( x_1 \) and \( x_2 \) in some space \( x_6 \) with a vertical dimension, a positive degree \( x_3 \) on some appropriate distance scale for \( x_6 \), a deictic space \( x_4 \), and an origo \( x_5 \) such that:

1. \( x_2 \) is some location \( x_7 \) in \( x_4 \) or designated by that location, and
2. \( x_1 \) is lower than \( x_2 \) by \( x_3 \).

(For the notion of designation, cf. Section 2 above.) Here, \( x_1 \), \( x_2 \), \( x_3 \), and \( x_7 \) function as the \textit{denotatum}, the \textit{relatum}, the \textit{extent}, and the \textit{demonstratum} of \( \text{BELOW-LOC-THERE}_{\text{stat}} \), respectively. Since \( \text{BELOW-LOC-THERE}_{\text{stat}} \) inherits the deictic places \( x_4 \) and \( x_5 \) of \( \text{THERE} \), the lexical meaning of \( \textit{darunter}^\text{W} \) is deictic, too.

From \( \text{BELOW-LOC}_{\text{stat}} \), \( \text{BELOW-LOC-THERE}_{\text{stat}} \) inherits the extent argument “\( x_3 \).” Thereby it is predicted that \( \textit{darunter}^\text{W} \) likewise governs optional measure complements. As (52) and (64) show, this prediction is borne out:

\[
(64) \quad \text{Selbst bei Minusgraden auf der Erdoberfläche herrschen einige \, \textit{Meter} \, \text{ca.} \, 12 \, ^\circ \text{C}.
\]

Example (64) illustrates the normal, text-phorics, use of a simple prepositional adverb like \( \textit{darunter} \). In a normal utterance of (64), the demonstratum (implicit in \( \text{THERE} \) and thereby also \( \text{BELOW-LOC-THERE}_{\text{stat}} \)) is a location in a textual deictic space: the utterance part \( \text{der Erdoberfläche} \), which is interpreted as a sign for the relatum \( x_2 \), the earth’s surface. Actually, it is the earth’s surface \textit{qua} location⁴⁴ which is phorically taken up by \( \textit{darunter} \) here, since the relatum is sortally restricted to locations in \( \text{BELOW-LOC}_{\text{stat}} \) and \( \text{mutatis mutandis} \) in \( \text{BELOW-LOC-THERE}_{\text{stat}} \). In this use

^43 The definiens in (63) is determined in word formation by means of an operation combining attributes like \( \text{THERE} \) and \( \text{BELOW-LOC}_{\text{stat}} \) into attributes like \( \text{BELOW-LOC-THERE}_{\text{stat}} \). Let us call this operation “\( \text{COMB} \)” and define it in the following, general way:

\[
(\text{i}) \quad \text{COMB}(P_1, P_2) = \text{def} \left( \lambda x_1, x_2, \ldots, x_n, y_1, \ldots, y_m \right) (P_1(x_1, x_2, \ldots, y_m) \wedge P_2(x_1, x_2, \ldots, x_n))
\]

As the reader may verify, \( \text{COMB} \) can also build the intensions of the lexical meanings of the prepositional adverbs to be discussed below.

^44 This may remind the reader of Pustejovsky’s (1995) ‘dot objects’. I leave open whether the semantics of prepositional adverbs proposed here actually presupposes an ontology including such entities.
of the local prepositional adverbs, the demonstrata can even be expressions for animated entities, provided that these expressions are interpreted as signs for the latter’s locations:

(65)  
\[
\text{Sie entdeckte eine Bäuerin, dahinter einen Hirten,}
\]
\[
\text{she noticed a farmer’s wife behind a location there a shepherd}
\]
\[
daneben einen Hund, in unmittelbarer Nähe dazu eine Schafherde.}
\]
\[
\text{next to a location there a dog immediately near a location there a sheep flock}
\]

‘She noticed a farmer’s wife, behind her a shepherd, next to him a dog, immediately near it a flock of sheep.’

Strictly speaking, a translation of (65) as in (66) would be more to the point:

(66)  
\[
\text{‘She noticed a farmer’s wife, behind her location a shepherd, next to his location a dog, immediately near its location a flock of sheep.’}
\]

According to Klabunde (2000: 198), the sortal restriction of the relatum to locations is the very semantic difference between local prepositional adverbs and the prepositions they are formed from:

Als Lokaladverb nimmt da- in den Pronominaladverbien nicht auf ein Referenzobjekt Bezug, sondern auf eine spezielle Raumregion, nämlich den Eigenort des Referenzobjekts. […] Der Unterschied liegt in der Referenz auf das Referenzobjekt bei den Präpositionen vs. der Referenz auf den Eigenort des Referenzobjekts bei den Pronominaladverbien.

[Being a local adverb, da- does not refer, in pronominal adverbs, to a reference object, but to a special spatial region, viz. the proper location of the reference object. … The difference lies in the reference to the reference object in the case of prepositions vs. the reference to the proper location of the reference object in the case of pronominal adverbs.]

I agree with Klabunde (2000) that lexical meanings of prepositional adverbs formed from local prepositions have an intension where the relatum is a location. I disagree with him as to the reason for this restriction, though: it is not the lexical meaning of the adverb which is responsible for it, but the lexical meaning of the preposition.

In fact, the denotatum of THERE is not necessarily a location. Rather, it is determined via the demonstratum: a location in a deictic space, which is identical with the denotatum or designates it. If the demonstratum is a location in a textual space and is interpreted as a sign for the denotatum of THERE, then the latter is not sortally restricted to locations (cf. Example (9) above). In the case of \( \text{darunter}_{10}^{W} \), to be discussed in Section 4.3 below, the corresponding entity (the relatum \( x_{2} \)) likewise needs not be a location:

(67)  
\[
\text{In vielen Fächern, darunter Deutsch und Matematik, war er einer der Besten.}
\]
\[
\text{in many subjects among mult stat German and mathematics he was one the best}
\]
\[
\text{‘In many subjects, among them German and mathematics, he was one of the best.’}
\]

Now, under the assumption that \( \text{darunter}_{1}^{W} \) and \( \text{darunter}_{10}^{W} \) are both formed from \( \text{da}^{W} \), their semantic difference can only be traced back to the fact that they are formed from different prepositions \( \text{unter}_{1}^{W} \) and \( \text{unter}_{10}^{W} \), respectively.

As the reader will recall from Section 3, the relatum \( x_{2} \) is sortally restricted to locations in \( \text{BELOW-LOC}_{\text{stat}} \) (the intension of the lexical meaning of \( \text{unter}_{1}^{W} \), from which \( \text{darunter}_{1}^{W} \) is formed), while in \( \text{AMONG-MULT}_{\text{stat}} \) (the intension of the lexical meaning of \( \text{unter}_{10}^{W} \)), it can be a multitude –
In general, contextualised attributes can be defined in the following schematic way:

Of course, such conjunctions are not restricted to the meanings of prepositional adverbs but apply across the board. In particular, there this observation to Gisela Zifonun (p.c.).

This does not conflict with the General Valency Hypothesis, as assumed by Lieb (1993: 448–451), if the relational argument “x₂” is taken to be another deictic place of the lexical meaning of *darunter*₁, in addition to the deictic places x₄ and x₅, by which x₂ is determined.

I owe this observation to Gisela Zifonun (p.c.).

In general, contextualised attributes can be defined in the following schematic way:

(i) Let P be an n-place attribute, with n ≥ 1, and X₂ an utterance of X₁ realising a syntactic unit in which f occurs. 

\[ P_{X₁, X₂}(x₁, \ldots, xₙ) \text{ def } X₁ \text{ is willing at the f-part of } X₂ \text{ to assume that } P(x₁, \ldots, xₙ). \]

Note that the definiendum holds, too, if X₁ is erroneously willing at the f-part of X₂ to assume that P(x₁, \ldots, xₙ), i.e., if P(x₁, \ldots, xₙ) is actually false. In contrast, Lieb’s (1983: chap. 18) notion of reference basis also allows for the case that X₁ is willing at the f-part of X₂ to assume that \( \neg P(x₁, \ldots, xₙ) \). I leave open here whether such a complication is actually necessary.

46 Of course, such conjunctions are not restricted to the meanings of prepositional adverbs but apply across the board. Since the validity of contextualised attributes only depends on speaker attitudes and not on truth, non-contextualised attributes cannot be replaced, but only supplemented, by contextualised attributes in syntactic semantics. Where needed, both contextualised and non-contextualised attributes will be relativised to times (cf. Note 20 above).
same way as the intension of the lexical meaning of \( \text{darunter}_1 \) was built from the intensions of the lexical meanings of \( \text{da}_1 \) and \( \text{unter}_1 \):

\[
(69) \quad \text{CAUSED-BY-A-BURDENING-SOA-THERE} = \text{def} \\
\left( \lambda x_1 x_2 x_3 x_4 \right) \left( \text{THERE} (x_2, x_3, x_4) \land \text{CAUSED-BY-A-BURDENING-SOA} (x_1, x_2) \right)
\]

Here, the attribute \( \text{CAUSED-BY-A-BURDENING-SOA-THERE} \) is a four-place intensional relation between an entity \( x_1 \), a state of affairs \( x_2 \), a deictic space \( x_3 \), and an origo \( x_4 \) such that:

1. \( x_2 \) is a location in \( x_3 \) or designated by such a location, and
2. \( x_2 \) is a burden causing \( x_1 \).

As noted in Section 3.9, \( \text{CAUSED-BY-A-BURDENING-SOA} \) does not have an extent argument. As a consequence, neither does \( \text{CAUSED-BY-A-BURDENING-SOA-THERE} \).

The fact that prepositional adverbs like \( \text{darunter}_9 \) in general do not phorically take up persons or other animated entities can now be explained as follows. In both \( \text{CAUSED-BY-A-BURDENING-SOA} \) and \( \text{CAUSED-BY-A-BURDENING-SOA-THERE} \), the relatum \( x_2 \) is sortally restricted to states of affairs. Above, I have assumed that syntactic semantics accommodates the lexical preposition meaning ‘caused by a burdening state of affairs’ by means of the accommodating relation \( \text{SOA} \) in order to properly relate the relatum argument to the interpretation of nominal preposition complements, whose denotatum is not necessarily a state of affairs itself. Since prepositional adverbs do not govern such complements, syntactic semantics will not apply \( \text{SOA} \) to the relatum argument of \( \text{CAUSED-BY-A-BURDENING-SOA-THERE} \). As a consequence, \( \text{darunter}_9 \) can only phorically take up entities which are readily interpreted as states of affairs. Such an interpretation is easy for, say, a heat state, but particularly difficult in the case of persons and other animated entities:

\[
(70) \quad \text{Die Hitze war unerträglich. Sie litt sehr darunter.} \quad \text{The heat was unbearable. She suffered a lot from it.}
\]

\[
(71) \quad \text{# Kennst du ihren Mann? Sie litt sehr darunter.} \quad \text{know you her husband she suffered very caused-by-a-burdening-soa-there}
\]

Since the relatum argument “\( x_2 \)” is not existentially bound in (69), the state of affairs expressed by it can be specified in correlate constructions by an infinitival or clausal complement, providing the implicit demonstratum (cf. the examples in (46) in Section 3.9 above). This is another reason not to bind the relatum argument by an existential quantifier in the intension of lexical prepositional adverb meanings.

4.3 ‘Among a multitude there (static)’

The intension of the lexical meaning \( \text{darunter}_{10} \) is built in the now familiar way from the intensions of the lexical meanings of \( \text{da}_{10} \) and \( \text{unter}_{10} \):

\[
(72) \quad \text{AMONG-MULT-THERE}_{\text{stat}} = \text{def} \left( \lambda x_1 x_2 x_3 x_4 \right) \left( \text{THERE} (x_2, x_3, x_4) \land \text{AMONG-MULT}_{\text{stat}} (x_1, x_2) \right)
\]

\( \text{AMONG-MULT-THERE}_{\text{stat}} \), a four-place intensional relation, holds between an entity \( x_1 \), a multitude \( x_2 \), a deictic space \( x_3 \), and an origo \( x_4 \) if, and only if:

1. \( x_2 \) is a location in \( x_3 \) or designated by such a location, and
2. \( x_2 \) encompasses \( x_1 \).
Again, there is no extent argument involved in either \textit{AMONG-MULT}$_{\text{stat}}$ or \textit{AMONG-MULT-THERE}$_{\text{stat}}$.

Given (72), we predict that $\text{darunter}^W_{10}$ can phorically take up entities of any sort, in particular persons or other animated entities. As shown in Section 1, this prediction is in fact borne out (cf. Example (5) there).

5 Results

In this paper, I have defended the hypothesis that each prepositional adverb in Modern German is formed from an adverb and a preposition – and not from two adverbs. In particular, I have shown on the example of $\text{darunter}$ that the intensions of the lexical meanings of non-idiotic prepositional adverbs are compositionally built from the intensions of preposition meanings by combining them in an appropriate way with the intension of an adverb meaning.

In total, I have distinguished eleven lexical words $\text{darunter}^W_1$ to $\text{darunter}^W_{11}$, which are each formed from the deictic adverb $\text{da}^W$ and one of the prepositions $\text{unter}^W_1$ to $\text{unter}^W_{11}$. (The converse was not assumed to hold: there are $\text{unter}$ variants for which there is no corresponding prepositional adverb.) The intensions of the lexical meanings of the prepositional adverbs are built from the intensions of the lexical meanings of the bases by identifying the denotatum argument of the intension of the lexical meaning of the adverbial base with the relatum argument of the intension of the lexical meaning of the corresponding prepositional base. From the latter, the intension of the prepositional adverb meaning inherits an extent argument, if any. Syntactically, prepositional adverbs govern measure expressions if, and only if, their prepositional basis does.

The animacy problem – the problem that the relatum of the intension of many prepositional adverb meanings is sortally restricted to certain non-animated entities – has been solved by the following assumptions. The sortal restriction is inherited from the lexical meaning of the prepositional basis. Syntactic semantics can accommodate preposition meanings by an accommodating relation in order to properly relate the preposition complement meaning to the relatum argument. In the case of local prepositions like $\text{unter}^W_1$, $\text{unter}^W_2$, $\text{unter}^W_7$, or $\text{unter}^W_8$, this allows for animated denotata of preposition complements. Prepositional adverbs, however, do not govern such complements, their valence being lexically reduced by one. Syntactic semantics therefore does not apply an accommodating relation to the relatum argument of the intension of their lexical meaning. As a consequence, the lexical semantic restriction of relata to locations carries over to the syntactic semantics of $\text{darunter}^W_1$, $\text{darunter}^W_2$, $\text{darunter}^W_7$, and $\text{darunter}^W_8$. The same holds, $\text{mutandis mutatis}$, for prepositional adverbs like $\text{darunter}^W_3$; here, the intension of its lexical meaning is built from the intension of a preposition meaning with a sortal restriction of the relatum to states of affairs. As a rule, such prepositional adverbs can function as a correlate of an infinitival or clausal constituent, which makes the state of affairs explicit.

All in all, there is ample semantic evidence for the hypothesis stated in (1): prepositional adverbs in Modern German are best analysed as being formed from an adverb and a preposition – arguably by a non-productive, but fully transparent compounding pattern. Their dependency on a formally and semantically matching preposition can even lead to the loss of a prepositional adverb when its prepositional basis happens to vanish from the lexicon. A case in point is $\text{ab}$, which in Modern German no longer means ‘off’ as a preposition, but only as an adverb and a verb particle (cf. Paul 1916–1920: vol. 4, 3 f.). As a consequence, the prepositional adverb $\text{darab}$, based on this former preposition, has been lost in Modern German (though it still exists in German dialects where the corresponding preposition has survived; cf. Fleischer 2002: 48 f.). The suggestion that prepositional adverbs are formed from two adverbs may be diachronically correct, but can hardly be maintained for Modern German.
References


List of sources


