

# Resolving scope in manner modification

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## 1 Introduction

Standard semantic analyses of manner modification usually a) use event variables in their representation and b) use a conjunctive format, cf. the sentence and its formal representation in (1).<sup>1</sup>

- (1) Sarah runs fast.  
 $\exists e[\text{AGENT}(\text{sarah}, e) \ \& \ \text{RUN}(e) \ \& \ \text{FAST}(e)]$

If more than one manner modifier is present, this is straightforwardly dealt with through the addition of another conjunct, cf. (2).

- (2) Sarah loudly answered stupidly.  
 $\exists e[\text{AGENT}(\text{sarah}, e) \ \& \ \text{ANSWER}(e) \ \& \ \text{LOUD}(e) \ \& \ \text{STUPID}(e)]$

The representation in (2) accounts for the entailments in (3), which can be derived from the semantic representation through conjunction reduction.

- (3) Sarah loudly answered stupidly.  
a. Sarah answered stupidly.  
b. Sarah loudly answered.  
c. Sarah answered.

In addition, the conjunctive format of the representation leads one to suspect that the conjunction of the two modifiers in the surface sentence would lead to the same interpretation, which is indeed the case, cf. (4).

- (4) Sarah answered loudly and stupidly ( $\approx$  (3))

However, this account runs into problems when it is used for sentences like the ones in (5).

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<sup>1</sup>I use the Neo-Davidsonian notation (cf. Parsons (1990)). For the problem addressed in this paper, this is of no relevance, and a notation following Davidson's original proposal (cf. Davidson (1967)), e.g.  $\exists e[\text{RUN}(e, s) \ \& \ \text{FAST}(e)]$ , could just as well be used.

- (5) a. John painstakingly wrote illegibly.  
 b. Malika carefully spoke softly.  
 Cf. for [a] Parsons (1972), for [b] Piñón (2007)

(5-a) must be interpreted so that the illegibility of the writing is part of what John took pains to do (cf. Parsons (1972)). Similarly, for (5-b), the speaking softly was what Malika was doing carefully. Neither (5-a) nor (5-b) display the entailment pattern predicted by the standard account, cf. (6), nor are they equivalent to sentences where the two modifiers are conjoined, cf. (7).

- (6) a. John painstakingly wrote illegibly.  $\nrightarrow$  John wrote painstakingly.  
 b. Malika carefully spoke softly.  $\nrightarrow$  Malika spoke carefully.  
 (7) a. John wrote painstakingly and illegibly. ( $\neq$  (5-a))  
 b. Malika spoke carefully and softly. ( $\neq$  (5-b))

Note that the scope-taking adverbials do not serve as sentence adverbials. A typical example for the use of *carefully* as a sentence or clausal adverbial is given in (8), the difference between clausal usages and the readings under discussion here will be discussed in more detail in section 3.

- (8) Carefully, Malika turned off the gas before lighting her cigarette.

In this paper, I will investigate a) what kind of adverbials give rise to these scopal manner readings and b) how sentences showing these two readings can be formally represented.

I argue that the scope-taking manner adverbials belong to a different subtype of manner modification than the adverbials in their scope. In the formal analysis, only the scope-taking adverbials are analyzed as predicates of events, and the adverbials in the lower position lead to predications over manners.

The paper is organized as follows: section 2 presents data from German involving scope-taking manner adverbials. Section 3 takes a look at the semantics and syntax involved, section 4 presents previous approaches, and section 5 gives my formal analysis. In section 6, this analysis is set into a broader perspective of analyzing adverbial modification with the help of approaches using underspecification, and section 7 gives a short conclusion.

## 2 Data

Data which parallels the *painstakingly*-sentence from Parsons (1972) is rare and does often require contextual support. In addition, the differences between the readings of interest and other possible adverbial readings are often very subtle, requiring native speaker competence. Therefore, I will base my discussion and analysis on German data and only point to English data when appropriate.

To start with, Parsons' original example has a German translation equivalent exhibiting the same properties, cf. (9).<sup>2</sup>

<sup>2</sup>Note that German uses adjectival forms instead of adverbs to express manner modification. This

- (9) Fritz hat sorgfältig unleserlich geschrieben.  
 F. has painstaking illegible written  
 'Fritz painstakingly wrote illegibly.'

As already noticed by Bartsch (1972)<sup>3</sup>, the same scope effect also occurs when the lower adverbial is changed to a more standard manner adverbial like *langsam* 'slowly', cf. (10).

- (10) x schreibt sorgfältig langsam.  
 x writes painstaking slowly  
 'x painstakingly writes slowly'  
 From Bartsch (1976, p. 299)

Again, the interpretation that we want here is the one where the agent takes care to write slowly, the writing itself might not have been particularly careful.

Another example comes from Frey and Pittner (cf. Frey and Pittner (1999) and Frey (2003)), cf. (12).<sup>4</sup>

- (11) Hans hat geschickt die Fragen dumm beantwortet.  
 H. has skilful the questions stupid answered  
 'Hans skilfully answered the questions stupidly.'  
 = (76a) in Frey (2003)

The reading we are interested in is one where the answering stupidly is done in a clever way. Again, we are not interested in the clausal reading, which would lead to an interpretation like *It was skilful of Hans, that he answered the questions stupidly*. A context providing the pragmatics for the reading under discussion is given in (12).

- (12) Even after seven days of solitary confinement did Hans answer the questions so cleverly stupidly, that no one could possibly suspect that he knew the answers by heart. Unfortunately, it turned out that to answer at all was already a stupid mistake.

Other examples from German are given in (13). To get the correct reading, imagine a robbery-context, where the thief aims at not being noticed.

- (13) a. Peter ist geschickt leise die Treppe hochgeschlichen.  
 Peter is skilful quiet the stairs crept\_up  
 'Peter skilfully crept up the stairs quietly.'  
 b. Fritz hat vorsichtig die Tür leise geschlossen.  
 F. has careful the door quiet closed

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leads to the mismatches between the forms in the English glosses and the free translations.

<sup>3</sup>Bartsch's work exists in the original German version, Bartsch (1972), and in a slightly revised English translation, Bartsch (1976). All following references will be made to the English version.

<sup>4</sup>Frey and Pittner point to the the English example given in Cinque (1999, p. 19), reproduced here as (i), as the source for their example.

- (i) John has been cleverly answering their questions cleverly/stupidly.  
 =(88) Cinque (1999, p. 19)

‘Fritz carefully closed the door quietly.’

### 3 The usages of the adverbials

Before embarking on the quest for an adequate formalization of scope-taking manner adverbials, we must ensure that the scope-taking adverbials as well as those in their scope are in fact serving as manner adverbials and do not belong to some other subclass of adverbials.<sup>5</sup> And, even given that both serve as manner adverbials, we will investigate whether or not they belong to different subclasses of manner adverbials. Thus, Parsons (1990, p. 289f., fn 17,22)) claims that *painstakingly* in (5-a) is not a manner adverbial but a subject-oriented or sentence adverbial. If this were true, the scopal behavior would be predicted, since it is generally assumed that sentence and subject-oriented adverbials stand for relations to the propositions expressed by their sentential base (cf. e.g. the remark in Parsons (1990, p. 64)).

In the following four sections, we will first establish that in all cases both adverbials serve as manner adverbials. Secondly, we focus on the semantic differences between the scope-taking adverbials and the adverbials in the scope. In the last two sections, we will look at the syntactic positions of the adverbials involved and at the lexical semantics of the items serving as scope-taking adverbials.

#### 3.1 Two instances of manner modification

The term *manner adverbial* is not clearly defined in the literature. Here, we will assume that the availability of the two standard paraphrases suffices for the classification as a manner adverbial.<sup>6</sup> The two standard paraphrases for manner adverbials, the *How-that-is-* and the *In-X-manner-*paraphrase, are exemplified in (14).

- (14) Petra tanzt wunderbar. ( $\approx$  a, b)  
 Petra dances wonderful
- a. Wie Petra tanzt, das ist wunderbar.  
 ‘How Malika dances, that is beautiful.’
  - b. Petra tanzt auf wunderbare Art und Weise.  
 ‘Malika dances in a beautiful manner.’

The scope-taking adverbials in the German sentences all allow both paraphrases, cf. the following examples.

- (15) Fritz hat sorgfältig unleserlich geschrieben. ( $\approx$  a, b)  
 ‘Fritz painstakingly wrote illegibly.’
- a. Fritz hat auf sorgfältige Art und Weise unleserlich geschrieben.  
 ‘Fritz wrote illegible in a careful manner.’

<sup>5</sup>That the scope-taking adverbials in the examples under discussion are manner adverbials is a point made in Bartsch (1972, pp. 270ff), Peterson (1997, p. 241ff), Cinque (1999, p. 19), Schäfer (2005, chapter 6) and Piñón (2007).

<sup>6</sup>For these tests, cf. Bartsch (1972) and the discussion in Schäfer (2005, chapter 3).

- b. Wie Fritz unleserlich geschrieben hat, das war sorgfältig.  
'How Fritz wrote illegible, that was careful.'
- (16) Hans hat geschickt die Frage dumm beantwortet. ( $\approx$  a, b)  
'Hans skilfully answered the question stupidly.'
- a. Hans hat auf geschickte Art und Weise die Frage dumm beantwortet.  
'Hans answered the question in a skilful manner stupidly.'
- b. Wie Hans die Frage dumm beantwortet hat, das war geschickt.  
'The way in which Hans answered the question stupidly was skilful.'
- (17) Peter hat vorsichtig leise die Tür geschlossen. ( $\approx$  a, b)  
'Peter cautiously closed the door quietly.'
- a. Wie Peter die Tür leise geschlossen hat, das war vorsichtig.  
'How Peter closed the door quietly, that was cautious.'
- b. Peter hat die Tür auf vorsichtige Art und Weise leise geschlossen.  
'Peter in a cautious manner quietly closed the door.'

The possibility to add an agentive *by*-phrase to the *How-that-is* paraphrase shows that the scope-taking adverbials all function as agent-oriented manner adverbials (for this terminology, cf. Ernst (2002), who speaks of the manner usage of agent-oriented adverbs, and Schäfer (2005)).

- (15b') Es war sorgfältig von Fritz, wie er unleserlich geschrieben hat.  
'How he wrote illegible, that was careful of Fritz.'
- (16b') Wie er die Frage dumm beantwortet hat, das war geschickt von Hans.  
'How he answered the question stupidly, that was skilful of Hans.'
- (17b') Wie er leise die Tür geschlossen hat, das war vorsichtig von Peter.  
'How he quietly closed the door, that was cautious of Peter.'

In German, the morphology clearly indicates that the adjectives serving as the scope-taking adverbials are not clausal adverbials, since a morphologically marked adverb-form, *ADJ-erweise*, has to be used for the sentential readings, cf. the examples in (18).<sup>7</sup>

- (18) a. Fritz hat sorgfältigerweise unleserlich geschrieben.  
F. has carefully illegible written.  
'Carefully, Fritz wrote illegibly.'
- b. John hat geschickterweise die Frage dumm beantwortet.  
J. has skillfully the question stupid answered

<sup>7</sup>With comma intonation, it seems possible to get the clausal readings even with the adjectival forms, cf. e.g. (i-a), which can get the same interpretation as (i-b).

- (i) a. Peter hat, intelligent, die Fragen erst garnicht beantwortet.  
Peter has, intelligent, the question MOD\_PART not at all answered.  
'Peter, intelligently, didn't even bother to answer the questions.'
- b. Peter hat intelligenterweise die Fragen erst garnicht beantwortet.  
Peter has, intelligent, the question MOD\_PART not at all answered.  
'Peter, intelligently, didn't even bother to answer the questions.'

- ‘Carefully, John answered the question stupidly.’
- c. Anna hat vorsichtigerweise die Tür leise geschlossen.  
 A. has cautiously the door quiet closed  
 ‘Cautiously, Anna quietly closed the door.’

This contrasts with English, where clausal readings are also realized with help of *-ly*-adverbs, as is shown by the free translations in (18). Besides the morphological difference in German, clausal adverbs never allow the standard manner paraphrases. Instead, they can be paraphrased parallel to the pattern in (19), which gives a paraphrase for (18-a).

- (19) Es war sorgfältig (von Fritz), dass er unleserlich geschrieben hat.  
 ‘It was careful (of Fritz), that he wrote illegibly.’

In this context, note that Potts (2005, p. 139ff.) in his examples for *supplementary adverbs* also distinguishes two different manner-adverbial readings. However, as his discussion shows, only one of the two readings corresponds to what we have called manner adverbials here. The other reading corresponds to a sentence-adverbial usage.

The other adverbials in the three sentences, that is, *unleserlich* ‘illegibly’, *dumm* ‘stupidly’ and *leise* ‘softly’, also all allow the standard manner paraphrases, cf. (20) through (22). Note that, due to the presence of the scope-taking adverbial, the *How-that is*-paraphrase cannot be used on the original sentence. To avoid confusion, the two paraphrases are all given for the sentences without the scope-taking adverbial.

- (20) Peter hat unleserlich geschrieben. ( $\approx$  a,b)  
 ‘Peter wrote illegibly.’
- a. Wie Peter geschrieben hat, das war unleserlich.  
 ‘The manner in which Peter wrote was illegible.’
- b. Peter hat auf unleserlich Art und Weise geschrieben.  
 ‘Peter wrote in an illegible manner.’
- (21) Hans hat die Frage dumm beantwortet. ( $\approx$  a,b)  
 ‘Hans answered the question stupidly.’
- a. Wie Hans die Frage beantwortet hat, das war dumm.  
 ‘How Hans answered the question, that was stupid.’
- b. Hans hat die Frage auf dumme Art und Weise beantwortet.  
 ‘Hans answered the question in a stupid manner.’
- (22) Anna hat die Tür leise geschlossen. ( $\approx$  a,b)  
 ‘Anna closed the door quietly.’
- a. Wie Anna die Tür geschlossen hat, das war leise.  
 ‘How Anna closed the door, that was quiet.’
- b. Anna hat die Tür auf leise Art und Weise geschlossen.  
 ‘Anna closed the door in a quiet manner.’

The three adverbials are all slightly different in their relationship to the event referred to by the verbal predicate. The first adverbial, *illegibly*, only indirectly characterizes the manner. As Dik (1975, p. 119) puts it: “What we want to express, rather, is that the man-

ner in which John writes is such that what he writes is illegible.”<sup>8</sup> The second adverbial, *stupidly*, belongs to the class of agent-oriented manner adverbials. These adverbials express that an action is executed in a way one would expect of someone who is ADJ. The third adverbial, *softly*, is a pure manner adverbial, directly specifying the manner in which the action is carried out.

### 3.2 The differences between the two adverbials

Already Bartsch (1976, pp. 296ff) argues that the key to the analysis of the sentences containing scope-taking manner adverbial lies in recognizing that the scope-taking and the adverbial in the scope do not belong to the same class of manner adverbials. Frey and Pittner (1999) and Frey (2003) follow Bartsch in this, classifying the scope-taking adverbial and the adverbial in the scope into different adverbial classes. Paraphrases are used to show the difference in adverbial use. The relevant paraphrase patterns are reproduced in (23).

- (23) Petra kocht sorgfältig. (≈ a,b)  
 ‘Petra is cooking carefully.’
- a. Petra kocht, wobei sie sorgfältig ist.  
 ‘Petra is cooking; in doing this she is careful.’
  - b. Petra kocht, wobei sie sich sorgfältig verhält.  
 ‘Petra is cooking; in doing so she acts carefully.’
  - c. Petra kocht, wobei sie sorgfältig handelt.  
 ‘Petra is cooking; in doing so she acts carefully.’
- Cf. Bartsch (1976, p. 155)

If we use this paraphrase pattern for the sentence under discussion, it is very clear that it is only available for the scope-taking adverbials, never for the other adverbials, cf. as an illustration (24) vs (25).<sup>9</sup>

- (24) a. Hans hat geschickt die Frage dumm beantwortet. (≈ b)  
 Hans has skilful the question stupid answered  
 b. Hans hat die Frage dumm beantwortet, wobei er geschickt war.  
 ‘Hans answered the question stupidly. In doing so, he was skilful.’
- (25) a. Hans hat die Frage dumm beantwortet. (≠ b)  
 Hans has the question stupid answered  
 b. Hans hat die Frage beantwortet, wobei er dumm war.  
 ‘Hans answered the question. In doing so, he was stupid.’

The crucial question is now the following: what exactly does the availability of the paraphrase tell us about the adverbials and, more specifically, how should this difference in paraphraseability be reflected in the formal representation. Both Bartsch and Frey and Pittner share the intuition that the usages that do not allow the *wobei*-paraphrase pre-

<sup>8</sup>This corresponds to the comments made in Bartsch (1972, p. 273) on the same sentence. In Schäfer (2005, p. 158) I classify *illegibly* in this usage as an *implicit resultative*.

<sup>9</sup>It seems that the three paraphrases offered by Bartsch all express slightly different things. This is ignored in the following, and, for simplicity’s sake, only the (a)-paraphrase is used.

dicade of (Bartsch) respective characterize (Frey and Pittner) a process, whereas adverbials allowing the paraphrases do something more. As Frey (2003) puts it in discussing *careful* on a *wobei*-reading, they are used ‘to characterize the subject in relation to the whole action described by the sentence.’ (p. 191) (For Bartsch’s view, cf. the discussion of her formal analysis in the next section). This intuitive account raises some more questions, e.g., which process, and what is the relation of this process to the whole action, and what does it mean to be characterized in relation to the whole action? I propose that we should simply analyze those adverbials that allow the *wobei*-paraphrases as predicates of events, whereas the other adverbials only characterize a specific aspect of an event. What specific aspect? Here, I will assume that we do not have to specify this in any more detail at the level of formal semantics, but simply assume that this aspect is tied to the event argument through some underspecified relation. To flesh out this idea a little bit, look at the following two examples, the first again involving manner modification, the second involving local modifiers.

First, the example involving manner modification. Consider the two pairs of sentences below, (26) and (27).

- (26) a. Peter hat laut das Lied gesungen.  
He has loudly the song sung  
b. Peter hat das Lied laut gesungen.  
Peter has the song loudly sung  
‘Peter loudly sang the song.’
- (27) a. \*Fritz hat forte die Einleitung gesungen.  
Fritz has forte the introduction sung  
b. Fritz hat die Einleitung forte gesungen.  
Fritz has the introduction forte sung  
‘Fritz sang the introduction forte.’

To sing something *forte* is not necessarily to sing something loudly, but at least there are contexts where (26-b) and (27-b) can mean the exact same thing. However, (27-a) is ungrammatical, while (26-a) is OK. A further difference between *laut* and *forte* is that only the former can have a reading where the *wobei*-paraphrase is appropriate, whereas this paraphrase can never be used for *forte*. I suggest the reason for this is that the lexical meaning of *forte* is much more restricted than that of *loudly*: *forte* can only be used to specify a certain aspect of performing music, but it cannot be used to predicate of a music-performance-event. This is different for *laut*, which allows both readings: as already mentioned, it can mean exactly the same as *forte*, but it can also characterize the event globally, on this usage allowing the *wobei*-paraphrase.

This also allows to account for an interesting difference reported in Cresswell (1985, p. 186ff). Cresswell compared the sentence in (28) with those in (29).

- (28) Isolde audibly precedes Jeremy.  
= (4) in Cresswell (1985, p. 186)
- (29) a. Kiri sings audibly.  
b. Kiri dances audibly.  
= (10,11) in Cresswell (1985, p. 188)

According to Cresswell, what is actually audible in (29) must be the singing or dancing itself, whereas in (28) it could be the movements involved in the action of preceding or even some accompanying activity which leads to the audibility. This contrast does not depend on a particularity of the adverb *audibly*, as can be seen when it is exchanged to a garden-variety manner adverb like *loudly*, cf. (30) and (31).

(30) Isolde loudly precedes Jeremy.

- (31) a. Kiri sings loudly.  
b. Kiri dances loudly.

For (30) vs (31), we get exactly the same effects as for the *audibly*-sentence. The reason for this seems to go back to the same observation made with respect to the other manner readings discussed earlier in this section: In (30), the event is globally characterized as loud, and the *wobei*-paraphrase is again available for the corresponding German sentence, cf. (32).

- (32) a. Isolde geht laut Jeremy voran.  
I. walks loud J. ahead  
b. Isolde geht Jeremy voran, wobei sie laut ist.  
'Isolde precedes Jeremy. In doing so, she is loud.'

The *loudly* in the singing/dancing sentences, in contrast, characterizes aspects of the singing/dancing, and a *wobei*-paraphrase is not appropriate.

The second example involves local modifiers. Maienborn (2003) discusses data like (33).

- (33) a. Luise hat auf der Treppe gepfiffen.  
Luise has on the stairs whistled  
'Luise whistled on the stairs.'  
b. Luise hat auf den Fingern gepfiffen.  
Luise has on the fingers whistled  
'Luise whistled with her fingers.'  
= (24) in Maienborn (2003)

On Maienborn's account, the locative modifier in (33-a) locates the event, the locative modifier in (33-b) locates some 'integral constituent' of the event. These two types of locative modifiers seem thus to exhibit the very same basic pattern of global modification vs the characterization of a smaller aspect of the action as exhibited in manner modification.

### 3.3 The syntactic positions of the two adverbials

The scope-taking adverbials must precede the second adverbial in the sentences under discussion. This is true for the English as well as the German data. A different ordering can result in a) a different interpretation of the sentence b) ungrammaticality. An example for the former case is given in Peterson (1997, p.243), cf. (34).

- (34) a. John carefully sliced the meat quietly.

- b. John quietly sliced the meat carefully.  
= 51 in Peterson (1997, p.243)

Only (34-a) can be interpreted as saying that John's carefulness was directed towards the keeping the meat-slicing quiet and leaving open whether or not he was careful in the slicing itself.<sup>10</sup>

For German, Frey and Pittner (1999, pp. 20f) and Frey (2003) argue that the scope-taking adverbials, in their terminology *event-internal adverbials*, need to be minimally c-commanded by the argument they relate to, whereas the adverbials in the scope, in their terminology *process-related adverbials*, minimally c-command the verb or the predicate complex. These two different conditions result not only in a different linear ordering but also in a different ordering relative to the direct object, cf. (35).

- (35) event-internal adverbials > direct object > process-related adverbials  
Cf. Frey and Pittner (1999), their terminology

Although this analysis is not uncontroversial (cf. in particular Eckardt (1998), Eckardt (2003)), I will adopt it in the following.

### 3.4 Lexical semantics

The number of lexical items that can serve as scope taking manner adverbials is quite restricted.<sup>11</sup> For German, we have three different adjectives, *vorsichtig* 'cautious', *geschickt* 'skilful' and *sorgfältig* 'careful', outnumbering the English *ly*-adverbs reported to be able to serve as scope-taking adverbials (*painstakingly*, *carefully*) by one. I think the commonality in the lexical semantics of these items lies in their unclear status with regard to predications over individuals vs predications over events. Thus, we can usually classify adjectives into two groups: (a) adjectives that prototypically predicate of individuals and (b) adjectives that prototypically predicate over events. The question whether a certain adjective is an object- or an event-predicate is by no means trivial, although this issue is seldomly explicitly discussed (exceptions are Geuder (2000, pp. 9f) and Hansson (2007)). If we look at the adjectival bases of the wordforms serving as scope-taking adverbials from this perspective, it appears at the outset that they all are object predicates, or more specifically, object predicates denoting a certain disposition of an individual (cf. Geuder (2000, p. 9), who uses *careful* and *intelligent* as examples for these types of word meaning). Interestingly, Hansson (2007, pp. 123ff) classifies the corresponding German items as event-oriented. Her argumentation is that in many cases, only a concrete and perceivable manifestation of a property licenses ascribing that property to an individual. In other words, we can say *Peter is careful* only because we know that he is acting carefully. And this holds in both ways. If we are told that *Peter is careful*, we expect him to conduct his actions carefully. Other adjectives, e.g. *elegant*, behave differently: *Peter is elegant* is not related to Peter conducting his affairs in an

<sup>10</sup>Note that both (34-a) and (34-b) can be interpreted as expressing exactly the same meaning, which would then correspond to the meaning of (i).

- (i) John sliced the meat quietly and carefully.

<sup>11</sup>This is also noted in Parsons (1990, p.289, fn. 17).

elegant way. Even *intelligent*, although in Hansson (2007) treated on par with *careful*, is different, in that a statement like *Peter is intelligent* is not necessarily connected to Peter conducting his affairs intelligently.<sup>12</sup>

## 4 Previous formal semantic analyses

Here I discuss the analyses proposed in the literature for these kind of sentences.<sup>13</sup> The first discussion of these types of sentences can be found in Parsons (1972). His analysis corresponds to a formal representation along the lines of (36).

- (36) John painstakingly wrote illegibly.  
 PAINSTAKINGLY(ILLEGIBLY(WROTE))(john)

He used this example sentence to argue against the conjunctive, event-based format proposed in Davidson (1967). His analysis is one variant of the *predicate modifier theory*, at that time independently proposed by several authors (cf. Clark (1970), Montague (1970), Thomason and Stalnaker (1973), Kamp (1975)). While this approach can easily account for the scopal effects, it does not offer an explanation for why a) the scope effects are so rare b) what the internal semantic difference between the two adverbials concerned is or c) in how far this account would allow a differentiation of the semantics of *painstakingly* vs adverbs of the *intentional* or *allegedly* type.

The example from Parsons (1972) is taken up in Bartsch (1972), who adds another example from German and gives the formal representation in (38).

- (37) x schreibt sorgfältig langsam.  
 x carefully writes slowly  
 = (d) in Bartsch (1972, p. 273)
- (38) painstaking ( $r'_1$ ).  $r'_1 = (ir')(Q(r_1, r'))$ .  
 slowly( $r_1$ ). Acting( $r'$ ).  $r_1 = (ir) (P(x, r). \text{Writing-Process}(r))$

We will not go into all the details of this representation, but instead focus on the points most relevant to the difference between the scope-taking and the second manner adverbial. In (38), *i* stands for a variant of the iota-operator, *r* is a variable for processes, and *r'* a variable for actions. That is, both *sorgfältig* and *langsam* are analyzed as one-place predicates: *sorgfältig* predicates over an action, *slowly* over a process. The relation *Q* expresses that “the process *r* constitutes an aspect of the action *r'*, or is contained in it as one of its components” (p. 301). Importantly, none of the two adverbials is analyzed as a predicate of events, which are used by Bartsch in the analysis of other adverbials. A second point to note is that actions are, in Bartsch’s account, subclasses of processes. The reason for the introduction of this subclass is the availability of the *wobei*-paraphrases for this subclass of adverbials (cf. Bartsch (1976, p. 73)). I will come back to this proposal in the discussion of my own analysis.

Peterson (1997) offers an approach that adapts Davidson’s original treatment in order to handle embedded adverbial modification. He demonstrates this with a formal

<sup>12</sup>In fact, it is often safe to expect to the contrary.

<sup>13</sup>Note that I restrict myself here to only those authors explicitly addressing these kinds of sentences.

analysis of the sentence in (39), cf. (40).

(39) John carefully sliced the meat quietly.

= 51a in Peterson (1997, p. 243)

(40)  $\exists e_3[\text{Careful}(t_1 e_2 [\text{Quiet}$

$(t_1 e_1 [\text{Sliced}(\text{John, the meat, } e_1)], e_2)], e_3)]$

Cf. 58" in Peterson (1997, p. 243) where he uses x,y,z instead of  $e_{1-3}$

On this approach, the two adverbials are treated as one-place predicates of events, which are the referents of the definite descriptions. Both adverbials are analyzed as predicates of different events, where the difference lies in the complexity of the events: *quietly* is analyzed as a predicate of a *John\_slicing\_the\_meat*-event, *carefully* is analyzed as a predicate of a *John\_slicing\_the\_meat\_quietly*-event. This approach, similar to Parsons' proposal, gets the scope facts right, but fails to offer any insight into why not all adverbials lead to these scopal readings. In addition, it is hard to see how the formal representation in (40) could plausibly be derived compositionally.

Note that Peterson's approach leads to the introduction of a number of different events into the semantic representation, which is often scorned at by the philosophically minded semanticist (cf. Bennett (1988, p. 177) and Maienborn (2005)), but is as often taken as a matter of course in syntactic approaches (Cf. e.g. Ernst (2002) or the response on Maienborn (2005) in Ramchand (2005)<sup>14</sup>).

In Schäfer (2005), I propose to adapt the approach as presented in Parsons (1990) to the problem at hand. To deal with the fact that adverbials like *quickly* and *slowly* can simultaneously hold of the same event, cf. the sentence pair in (41), Parsons introduced a contextual parameter specifying the relevant comparison classes, compare the representation (42) for (41-a), where C represents the contextual parameter.

(41) a. Elsi ran quickly. [in comparison to her friends]

b. Elsi ran slowly. [in comparison to professional runners]

(42)  $\exists e[\text{RUNNING}(e) \ \& \ \text{SUBJECT}(\text{Elsi, } e) \ \& \ \text{SLOW}(e, C_{\text{Elsi's friends}})]$

Adjectives of the *carefully*, *cautiously* type typically can be contextually specified in the same way as *quickly*, but in addition, they can be evaluated against scales in different domains, which can often be made explicit by using *for* and *as*-phrases simultaneously, cf. *Peter is careful as a mountaineer for a 44-year-old*. Assuming that these adjectives always come with two instead of one parameter (cf. for the usage of two parameters also the remarks in Bierwisch (1989, p. 236f.)), the *skilfully-stupidly*-sentence can be represented as in (43).

<sup>14</sup>The formal representation adduced by Ramchand (2005) as an illustration in fact bears much resemblance to Peterson's approach, cf. (i).

(i) jones butter the toast quickly with a tiny knife  
 $\lambda e'' \exists e' \exists e [\text{BUTTERING}(e) \ \& \ \text{AGENT}(e, \text{Jones} \ \& \ \text{THEME}(e, \text{the\_toast}) \ \& \ \text{CONSTITUTIVE-EVENT}(e', e) \ \& \ \text{QUICKLY}(e') \ \& \ \text{CONSTITUTIVE-EVENT}(e'', e') \ \& \ \text{WITH\_A\_TINY\_KNIFE}(e'')]$   
 = (16) in Ramchand (2005)

- (43) Hans skilfully answered the question stupidly.  
 $\exists e$  [ANSWER( $e$ ) & SUBJ( $e$ , *Hans*) &  
 SKILFUL( $e$ ,  $C_{adults}^U$ ,  $C_{answering\_the\_question\_stupidly}^S$ ) &  
 STUPID( $e$ ,  $C_{adults}^U$ ,  $C_{answering}^S$ )]  
 Cf. (95) in Schäfer (2005, p. 174)

To cover the scope data, I argued that the parameter  $C^S$  is sensitive to syntactic scope, while the other parameter covers the remaining contextual effects. I believe now that this approach is problematic for several reasons. Firstly, we do not want to map the writing event onto some scale, but the writing\_illegibly event. Secondly, building the two parameters into the lexical entry of the adjective seems to overgenerate. Thirdly, syntactic scope does not always seem to be responsible for the correct interpretation, cf. e.g. an example from the domain of attributive modification, *the skilful French magician*, where *French* is in the scope of *skilful* but does not necessarily have anything to do with the interpretation (cf. Kennedy (2007) and Bierwisch (1989, p. 236f.)). Finally, no explanation is given why these readings are restricted to only a few lexical items or why there would be differences in paraphraseability.

The most recent treatment of these kind of sentences is the one given in Piñón (2007), cf. (44).

- (44) Rebecca painstakingly writes illegibly.  
 $\lambda e$ .agent(rebecca)( $e$ ) & write( $e$ ) & illegible(form(write)( $e$ )) &  
 painstaking(effort ( $\lambda e'$ .write( $e'$ ) & illegible(form(write)( $e'$ ))) ( $e$  )

Here, manners are treated as concrete particulars which are ontologically dependent on events (Cf. for this the remarks on Dik (1975) in the next section). In addition, there are different types of manners, e.g. form-manners for, in this case, ‘the trajectory of motion of the point of the writing event (e.g., a pen) in a writing event’, and effort-manners, do deal with the sort of manners *painstakingly* is predicated of. As with Bartsch’s account, I will come back to aspects of this analysis in the presentation of my own analysis.

## 5 Analysis

In my analysis, I will propose the following: a) manner adverbials can be interpreted either as predicates of events or as predicates of manners b) whether we have a predicate of manners or of events is syntactically determined c) adverbials analyzed as predicates of events automatically have scope over the manner-predicating adverbials.

### 5.1 Events and manners

While, as mentioned in the introduction, the analysis of manner adverbials as predicates of events is nowadays very much the standard view, a natural alternative is to treat manner adverbials as predicates of manners. The first proponent of this view was Dik (1975, pp. 117ff) (but cf. the analysis by Piñón (2007) mentioned above). He argues that all situations which involve control on part of the agent or a change, that is, which are

dynamic (e.g. processes and activities) do possess an implicit manner in which they are carried out. If a situation fulfills these criteria, manners are introduced with the help of meaning postulates (Dik refers to them as *redundancy rules*).

- (45) Annette dances beautifully.  
 $s_1 \text{ dance(Annette)}_{s_1} \& \text{ beautiful}(M_{s_1})$   
 = 146 in Dik (1975)

For Dik (1975), it is a matter of the lexical semantics of the verb whether a manner variable is available or not. I will here suggest a different pathway: the discussion in section 3 has shown that manner modification can either lead to the global characterization of an event or to the specification of some aspect of the event. This will be formally captured by the assumption that the former is realized through a predication over the event variable, and the latter through a predication over a manner variable. Since the adverbial use depends on the syntactic position of the adverbial, I assume that the availability of a manner variable is guided by syntax and results from the application of templates at specific syntactic positions. In the formal presentation, the manner variables are connected to the event variable by the underspecified relation MANNER. We therefore get the following representation for (45):

- (46)  $\exists e[\text{SUBJECT}(e, a) \& \text{DANCE}(e) \& \exists m[\text{MANNER}(e, m) \& \text{BEAUTIFUL}(m)]]$ <sup>15</sup>

Piñón (2007) gives good further arguments for the assumption of manners as concrete particulars. Firstly, assuming manners as concrete particulars allows a formal analysis that captures the difference between (47-a) and (47-b):

- (47) a. Malika saw Rebecca write illegibly.  
 b. Malika saw how Rebecca wrote.  
 =(5) in Piñón (2007)

In (47-a), an event is perceived, in (47-b), the manners of an event are perceived.

Secondly, once we have manners as concrete particulars, we also have an explanation for why the *in an X manner*-paraphrase can be used.

For the derivation of both readings, I assume that we start out from the lexical entry of the adjective, that is, for *illegible* we assume (48).<sup>16</sup>

- (48)  $\lambda x[\text{ILLEGIBLE}(x)]$

<sup>15</sup>I have already used a similar representation format in Schäfer (2003), but there the whole argumentation is based on far weaker evidence.

<sup>16</sup>This lexical entry is simplified, since all the adjectives discussed are gradable and therefore need to be able to interact with further degree semantics, cf. for one popular implementation Kennedy (2007). In that framework, a degree phrase is used to turn the adjective from a function mapping entities into degrees into a function from entities into truth values and providing the appropriate further semantics, here those of the positive form, so that [DegP [Deg pos] [AP illegible]] is analyzed as (i), where “s” is a context-sensitive function that chooses a standard of comparison in such a way as to ensure that the objects that the positive form is true of ‘stand out’ in the context of utterance, relative to the kind of measurement that the adjective encodes” Kennedy (2007, p. 17) .

- (i)  $\lambda x. \text{ILLEGIBLE}(x) \geq \mathbf{s}(\text{SKILFUL})$

These considerations play no role for the problems at hand.

In addition, we need a template to introduce the manner variable and to turn the predicate of type  $\langle e, t \rangle$  into a modifier of type  $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$ , cf. (49).

- (49) Template for manner adverbials:  
 $\lambda Q \lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ Q(m) ]]$

If this template is applied to the lexical entry of the adjective, we get (50).

- (50) Template Manner Adverbial applied to the lexical entry of the adjective:  
 a.  $\lambda Q \lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ Q(m) ]](\lambda x [ \text{ILLEGIBLE}(x) ])$   
 b.  $\lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ]]$

Finally, assuming for simplicity's sake that we add the rest in one chunk, cf. (51), we get the representation in (52).

- (51) John wrote.  
 $\lambda e [ \text{SUBJECT}(\text{John}, e) \ \& \ \text{WRITE}(e) ]$
- (52) John wrote illegibly.  
 a.  $\lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ]]$   
 $(\lambda e [ \text{SUBJECT}(\text{John}, e) \ \& \ \text{WRITE}(e) ])$   
 b.  $\lambda x [ \text{SUBJECT}(\text{John}, x) \ \& \ \text{WRITE}(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ]]$

## 5.2 Representing the scope-taking manner adverbial

For the other reading, we have assumed that the modifier predicates over the event variable.<sup>17</sup> However, it is obviously not enough to simply analyze the scope-taking manner adverbial as a predicate over the event variable introduced by the verbal predicate, which would lead to the representation in (53).

- (53) John painstakingly wrote illegibly.  
 $\exists e [ \text{SUBJECT}(\text{John}, e) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] \ \& \ \text{PAINSTAKING}(e) ]$

This is not an adequate representation, because it does not indicate that the manner variable is supposed to be tied to the event-predicate WRITE more tightly than to the event-predicate PAINSTAKING, nor does it indicate that *painstakingly* has scope over the second adverbial. Since the impossibility to represent scope in a flat conjunctive format also plays a role for other phenomena, different solutions to handle scope already exist in the literature, typically involving event summation (cf. Eckardt (1998) and Rothstein (2003)). Here, I will adapt the big event-approach by Eckardt (1998), which is used in order to account for the scope facts for sentences with quantified direct objects.

<sup>17</sup>Note that the two supporting arguments for a manner-based representation mentioned in the previous section, that is, the perceivability and the availability of the *In-X-manner*-paraphrase, can also be used to argue for a manner-based analysis of the scope taking adverbials, as in fact is done by Piñón (2007). I opt for the event-predicate analysis, because I believe it accounts better for the availability of the *wobei*-paraphrase and the intuition, discussed in detail in section 3, that somehow the action respectively the event as a whole is characterized by the scope-taking adverbials.

Basically, a big event, represent by the variable  $e^*$ , is a complex event, that is, it consist of smaller event objects. It is introduced into the semantic representation with the help of the big event clause, a template of the form  $\lambda P \lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \ \& \ P(e)]$ . This clause is added before VP, where  $e$  is existentially bound.<sup>18</sup> Everything else is quite straightforward: to turn the lexical entry of the adjectives into a modifier, we need a simple modification template, cf. (54).

- (54) Modification template MOD:  
 $\lambda Q \lambda P \lambda x [P(x) \ \& \ Q(x)]$   
 Cf. for similar operators Maienborn (2001), Dölling (2003)

Using again only a simplified lexical entry for the adjectives themselves, e.g. (55) for *painstakingly*, the derivation is given below.

- (55)  $\lambda x [\text{PAINSTAKING}(x)]$
- (56) Modification template applied to the lexical entry of the adjective:  
 a.  $\lambda Q \lambda P \lambda x [P(x) \ \& \ Q(x)]$   
 b.  $\lambda P \lambda x [P(x) \ \& \ \text{PAINSTAKING}(x)]$
- (57) Big event template applied at V'  
 a.  $\lambda P \lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \ \& \ P(e)] (\lambda e [\text{WRITE}(e)])$   
 b.  $\lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e)]$
- (58) [VP painstakingly [VP ... ]  
 a.  $\lambda P \lambda x [P(x) \ \& \ \text{PAINSTAKING}(x)] (\lambda e^* \exists e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e)])$   
 b.  $\lambda x [\exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e)] \ \& \ \text{PAINSTAKING}(x)]$
- (59) John painstakingly wrote.  
 $\lambda x [\text{SUBJECT}(\text{John}, x) \ \& \ \exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e)] \ \& \ \text{PAINSTAKING}(x)]$

Note that for both adverbial usages, we need at one point in the derivation to turn an individual predicate into a modifier. This is very clear in the case of the event-related usage, where the sole purpose of the modification template is to achieve this. For the manner modification template, this fact is a bit obscured because the template (49) combines a) the change from predicate to modifier and b) the introduction of a manner variable. For more transparency, we can split the template given in (49) into the modification template, corresponding to the one introduced in (54), and into a template for the manner variable, as in (60).

- (60) Template manner variable MA:  
 $\lambda P \lambda x \exists m [\text{MANNER}(m, x) \ \& \ P(m)]$

We will simply assume that the modification-template is applied per default whenever items of type  $\langle e, t \rangle$  are used adverbially.

<sup>18</sup>Note that Eckardt assumes that the subjects are generated inside VP, while I do not. A consequence of this is that in my account, the subject is related to the big event, and the object to the small event. I do not think that this creates a major problem.

### 5.3 Deriving the starter example

Deriving appropriate formal representations for the sentences under discussion is now straightforward and is demonstrated below for Parson's *John painstakingly wrote illegibly*-sentence, cf. e.g. (61) through (63) for everything but the subject.

- (61) ((MOD(MA(illegibly))) (write)) (Cf. (50) for MOD(MA(illegibly))):
- a.  $\lambda P \lambda x [P(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ] ] (\lambda x [\text{WRITE}(x)])$
  - b.  $\lambda x [\text{WRITE}(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ] ]$
- (62) Addition of the big event clause and existential quantification:
- a.  $\lambda P \lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \ \& \ P(e)]$   
 $(\lambda x [\text{WRITE}(x) \ \& \ \exists m [ \text{MANNER}(m, x) \ \& \ \text{ILLEGIBLE}(m) ] ])$
  - b.  $\lambda e^* \lambda e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ]$
  - c.  $\lambda e^* \exists e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ]$
- (63) MOD(painstaking) applied to the result of the last step:
- a.  $\lambda P \lambda x [P(x) \ \& \ \text{PAINSTAKING}(x)]$   
 $\lambda e^* \exists e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ]$
  - b.  $\lambda x [\exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(x)]$

The subject can now be introduced with the help of some standard template, cf. (64) and its application in (65).

- (64) Template SUBJ  
 $\lambda P \lambda y \lambda x [\text{SUBJECT}(y, x) \ \& \ P(x)]$
- (65) Template SUBJ applied to the result of the derivation in (64)
- a.  $\lambda P \lambda y \lambda x [\text{SUBJECT}(y, x) \ \& \ P(x)]$   
 $(\lambda x [\exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(x)])$
  - b.  $\lambda y \lambda x [\text{SUBJECT}(y, x) \ \& \ \exists e [\text{PART\_OF}(e, x) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(x)]$

This leads to the final representation in (66).

- (66)  $\exists e^* [\text{SUBJECT}(\text{John}, e^*) \ \& \ \exists e [\text{PART\_OF}(e, e^*) \ \& \ \text{WRITE}(e) \ \& \ \exists m [ \text{MANNER}(m, e) \ \& \ \text{ILLEGIBLE}(m) ] ] \ \& \ \text{PAINSTAKING}(e^*)]$

This representation captures the scope facts and gives a natural explanation for the possibility of *wobei*-paraphrases for the scope-taking adverbials.

## 6 Underspecification and the syntax-semantics interface

The manner modification template as given in (49) is modeled after templates that have been used elsewhere in the formal analysis of adverbial modification, namely the template MOD\* in Maienborn (2003) and the template MET' in Dölling (2003).

The data that lead Maienborn (2003) to introduce her template MOD\* appeared already in section 3 and is repeated as (67) for convenience.

- (67) a. Luise hat auf der Treppe gepfiffen.  
 Luise has on the stairs whistled  
 'Luise whistled on the stairs.'  
 b. Luise hat auf den Fingern gepfiffen.  
 Luise has on the fingers whistled  
 'Luise whistled with her fingers.'  
 = (24) in Maienborn (2003)

As mentioned earlier, Maienborn takes (67-a) to locate the event, whereas she assumes that the locative modifier in (67-b) locates some 'integral constituent' of the event.<sup>19</sup> To formally capture the two different readings, Maienborn (2003) introduces the template MOD\*, cf. (68).

- (68) MOD\*:  $\lambda Q\lambda P\lambda x[P(x) \ \& \ R(x, v) \ \& \ Q(v)]$

This is structurally very similar to the template for manner adverbials given above, cf. the repeated (49) in (69).

- (69)  $\lambda Q\lambda P\lambda x[ P(x) \ \& \ \exists m[ \text{MANNER}(m, x) \ \& \ P(m) ]]$

Instead of the relation MANNER, Maienborn uses the relational parameter R, and she does not existentially bind the variable v. Just as we assume here that the two different uses of manner modifiers are tied to different syntactic positions, Maienborn shows that the different readings of local modifiers are also linked to different syntactic environments, cf. (70).

- (70) a. Luise hat <sub>[VP [PP auf der Treppe] [VP [V gepfiffen]]]</sub>  
 b. Luise hat <sub>[VP [V [PP auf den Fingern] [V gepfiffen]]]</sub>  
 = (24') in Maienborn (2003)

Given this, Maienborn postulates the following condition on the realization of the free relational parameter R, cf. (71).

- (71) Condition on the application of MOD\*: If MOD\* is applied in a structural environment of categorial type X, then R = PART-OF, otherwise (i.e. in an XP-environment) R is the identity function.  
 = (30b) Maienborn (2003)

If we assume the semantic forms in (72) and (73) for the two PPs, and the semantic form in (74) for the verb, then we can derive the representations for the two different

<sup>19</sup>In Maienborn's terminology, the former serves as an event-external modifier, the latter as an event-internal modifier.

VPs, cf. (75) and (76), respectively.

- (72) [PP auf der Treppe]:  $\lambda x[\text{LOC}(x, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 (73) [PP auf den Fingern]:  $\lambda x[\text{LOC}(x, \text{ON}(f) \ \& \ \text{FINGERS}(f))]$   
 (74) [V gepfiffen]:  $\lambda e[\text{WHISTLE}(e)]$   
 (75) [VP [PP auf der Treppe] [VP [V gepfiffen]]]  
 a.  $\lambda x[\text{WHISTLE}(x) \ \& \ R(x, v) \ \& \ \text{LOC}(v, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 b.  $\lambda x[\text{WHISTLE}(x) \ \& \ = (x, v) \ \& \ \text{LOC}(v, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 c.  $\lambda x[\text{WHISTLE}(x) \ \& \ \text{LOC}(x, \text{ON}(t) \ \& \ \text{STAIRCASE}(t))]$   
 (76) [VP [PP auf den Fingern] [V gepfiffen]]  
 a.  $\lambda x[\text{WHISTLE}(x) \ \& \ R(x, v) \ \& \ \text{LOC}(v, \text{ON}(f) \ \& \ \text{FINGERS}(f))]$   
 b.  $\lambda x[\text{WHISTLE}(x) \ \& \ \text{PART\_OF}(x, v) \ \& \ \text{LOC}(v, \text{ON}(f) \ \& \ \text{FINGERS}(f))]$

For (75), the effect of using the operator MOD\* instead of the operator MOD introduced earlier is, due to the syntactic position of the adverbial, non-existent, i.e., the resulting representation is the same. In (76), however, the parameter R introduced by MOD\* is specified as PART\_OF. The exact nature of the free variable *v* and its relationship to the event variable will then be specified with the help of pragmatics.

Dölling (2003) also uses templates in his account of adverbial modification. He separates the templates into templates introducing the free parameters, labeled MET, cf. (77), and the general modification template MOD, discussed above.

- (77) Operator MET':  $\lambda P \lambda x. Qy [R(y, x) \ C \ P(y)]$   
 Cf. (13) in Dölling (2003)

Dölling uses R as a parameter for relations between elements of ontological sorts, and Q and C are paired parameters, which can be realized by either  $\exists \&$  or  $\forall \rightarrow$ .

By setting the paired parameters Q and C to  $\exists$  and  $\&$ , it can be seen that this operator is the underspecified model for the manner template, cf. (78).

- (78) a.  $\lambda P \lambda x. \exists y [R(y, x) \ \& \ P(y)]$   
       [Partially filled Template Met']  
 b.  $\lambda P \lambda x \exists m [ \text{MANNER}(m, x) \ \& \ P(m) ]$  [Template manner variable]

This kind of underspecified template can also be used as the basis for the template proposed by Maienborn.

In addition, we can adopt Maienborn's proposal to make the specific instantiation of the R relation sensitive to the syntactic environment in which the template appears.<sup>20</sup> This does not need much further work (at least for German), as the two different syntactic positions that Maienborn distinguishes correspond to the syntactic positions identified for the two usages under discussion by Frey and Pittner (cf. above). Thus we have e.g. (79-a), with the syntactic structure in (79-b).

- (79) weil Fritz sorgfältig unleserlich schreibt.

<sup>20</sup>This step is already suggested in Shaer (2003, p. 233)

(80) weil Fritz [<sub>VP</sub> sorgfältig [<sub>VP</sub> [<sub>V</sub> unleserlich [<sub>V</sub> schreibt]]]]

Adopting the condition proposed by Maienborn for MOD\*, cf. (71), for the template MA, we automatically derive the correct representation.

## 7 Conclusion

The analysis for scope-taking manner adverbials proposed here assumes that manner modification can be realized either through event-predicates or through manner-predicates. In particular, whenever a manner adverbial has scope over another manner adverbial, the higher adverbial is analyzed as a predicate of events, and the lower adverbial as a predicate of manners. The formal representation for sentences containing scope-taking adverbials can be automatically derived if we assume, following Maienborn (2003), that the specification of the semantic templates which are used is sensitive to the syntactic environment in which the template appears. In addition, the template used can be seen as one instance of an underspecified scheme for templates in the style of Dölling (2003).

## References

- Bartsch, Renate, 1972. *Adverbialsemantik. Die Konstitution logisch-semantischer Repräsentationen von Adverbialkonstruktionen*. Frankfurt(Main): Athenäum.
- , 1976. *The grammar of adverbials*, vol. 16 of *North Holland Linguistic Series*. Amsterdam, New York, Oxford: North-Holland. Improved Translation of Bartsch (1972).
- Bennett, Jonathan, 1988. *Events and Their Names*. Oxford: Oxford University Press.
- Bierwisch, Manfred, 1989. The semantics of gradation. In Bierwisch, Manfred and Ewald Lang (eds.), *Dimensional Adjectives. Grammatical Structure and Conceptual Interpretation*, pp. 71–261. Berlin: Springer.
- Cinque, Guglielmo, 1999. *Adverbs and Functional Heads. A Cross-Linguistic Perspective*. Oxford: Oxford University Press.
- Clark, Romane, 1970. Concerning the logic of predicate modifiers. *Nous*, 4:311–335.
- Cresswell, M. J., 1985. *Adverbial Modification. Interval Semantics and Its Rivals*, vol. 28 of *Studies in linguistics and philosophy*. Dordrecht: D. Reidel.
- Davidson, Donald, 1967. The logical form of action sentences. In Rescher, N. (ed.), *The logic of Decision and action*. Pittsburgh: Pittsburgh University Press.
- Dik, Simon C., 1975. The semantic representation of manner adverbials. In Kraak, A. (ed.), *Linguistics in the netherlands 1972-1973*, pp. 96–121. Assen: Van Gorcum.
- Dölling, Johannes, 2003. Flexibility in adverbial modification: Reinterpretation as contextual enrichment. In Lang et al. (2003), pp. 511–552.

- Eckardt, Regine, 1998. *Events, Adverbs, and Other Things. Issues in the Semantics of Manner Adverbs*. Tübingen: Niemeyer.
- , 2003. Manner adverbs and information structure. evidence from the adverbial modification of verbs of creation. In Lang et al. (2003), pp. 261–305.
- Ernst, Thomas, 2002. *The Syntax of Adjuncts*. Cambridge: Cambridge University Press.
- Frey, Werner, 2003. Syntactic conditions on adjunct classes. In Lang et al. (2003), pp. 163–209.
- Frey, Werner and Katrin Pittner, 1999. Adverbialpositionen im deutsch-englischen Vergleich. In Doherty, Monika (ed.), *Sprachspezifische Aspekte der Informationsverarbeitung*, vol. 48 of *Studia Grammatica*, pp. 14–40. Berlin: Akademie Verlag.
- Geuder, Wilhelm, 2000. *Oriented Adverbs. Issues in the Lexical Semantics of Event Adverbs*. Ph.D. thesis, Universität Tübingen.
- Hansson, Kerstin, 2007. *Adverbiale der Art und Weise im Deutschen. Eine semantische und konzeptuelle Studie*. Acta universitatis Gothoburgensis. Göteborgs Universitet.
- Kamp, H., 1975. Two theories about adjectives. In Keenan, E. L. (ed.), *Formal Semantics for natural languages*, pp. 123–155. Cambridge, UK: Cambridge University Press.
- Kennedy, Christopher, 2007. Vagueness and grammar: The semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy*, 30:1–45.
- Lang, Ewald, Cathrine Fabricius-Hansen, and Claudia Maienborn (eds.), 2003. *Modifying Adjuncts*. Mouton de Gruyter.
- Maienborn, Claudia, 2001. On the position and interpretation of locative modifiers. *Natural Language Semantics*, pp. 191–240.
- , 2003. Semantic underspecification and conceptual interpretation. In Lang et al. (2003), pp. 475–509.
- , 2005. On the limits of the Davidsonian approach: The case of copula sentences. *Theoretical Linguistics*, 31:383–396.
- Montague, Richard, 1970. English as a formal language. In Visentini, Bruno (ed.), *Linguaggi nella Società e nella Tecnica*. Edizioni di Comunità. Reprinted as chapter 6 of *Formal Philosophy. Selected Papers of Richard Montague*. Thomason, R. H. (ed.), Yale University Press, pp. 188–221.
- Parsons, Terence, 1972. Some problems concerning the logic of grammatical modifiers. In Davidson, Donald and Gilbert Harman (eds.), *Semantics of Natural language*, Synthese Library, pp. 127–141. Dordrecht: D. Reidel.
- , 1990. *Events in the Semantics of English. A Study in Subatomic Semantics*. No. 19 in *Current Studies in Linguistics*. Cambridge, MA: MIT.
- Peterson, Philip L., 1997. *Facts Propositions Events*. Dordrecht: Kluwer.

- Piñón, Christopher, 2007. Manner adverbs and manners. Handout, 7. EreignisseSemantik-Konferenz, Tübingen.
- Potts, Christopher, 2005. *The logic of conventional implicatures*. Oxford University Press.
- Ramchand, Gillian, 2005. Post-davidsonianism. *Theoretical Linguistics*, 31:359–373.
- Rothstein, Susan, 2003. Secondary predication and aspectual structure. In Lang et al. (2003), pp. 553–590.
- Schäfer, Martin, 2003. Before or after the the direct object: German adjectival adverbs and the syntax-semantics interface. In Weisgerber, Matthias (ed.), *Proceedings of 'sub7 – Sinn und Bedeutung'*, Konstanzer Arbeitspapiere Linguistik, pp. 272–281. Konstanz. <http://www.ub.uni-konstanz.de/kops/volltexte/2003/1103/>.
- , 2005. *German Adverbial Adjectives: Syntactic Position and Semantic Interpretation*. Ph.D. thesis, Universität Leipzig.
- Shaer, Benjamin, 2003. “Manner” adverbs and the “association” theory: Some problems and solutions. In Lang et al. (2003).
- Thomason, Richmond H. and Robert C. Stalnaker, 1973. A semantic theory of adverbs. *Linguistic Inquiry*, 4:195–220.

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