Manner Adverbs and Events: Resolving the Underspecification

Martin Schäfer [*]

Abstract

This paper argues that the relation between manner adverb and verbal predicate is often underspecified. Formally, this underspecification can be resolved by using a combination of the Operator- and Davidsonian approaches in the representations of sentences containing manner adverbs.

1   Introduction

This paper has two aims: on the one hand, I want to give a short overview of the common problems for a formalization of manner adverbs and introduce the two approaches most often used to deal with these problems. On the other hand, I concentrate on the problem of underspecification and discuss some consequences this has for a formalization.

The formalization of manner adverbs presents three well-known challenges:

1. The two sentences in (1) show that manner adverbs are sensitive to context, or more specifically, to comparison classes. (1-a) and (1-b) might well refer to the very same channel-crossing by Barbara, cf. [2].

    (1)   a.   Barbara crossed the channel slowly. [in comparison to Hovercrafts etc.]
            b.   Barbara crossed the channel quickly. [in comparison to other swimmers]

    This behaviour of manner adverbs led Davidson [2] to exclude manner adverbs from his considerations.

2. Manner adverbs may take scope over other manner adverbs. Accordingly, (2) might be interpreted as *John took pains to write illegible.*

    (2)   John painstakingly wrote illegibly.
            cf. [3, p. 131]

3. Formal representations of manner adverbs should ideally allow for the derivation of entailment relationsship such as those in (3).

    (3)   Peter sings loudly. → Peter sings.

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[*]   Institute of Linguistics, University of Leipzig

Manner adverbs have received two different formal analyses in the semantic literature, one referred to as operator approach (cf. [3], [5], [1]), the other as Davidsonian, or conjunctive approach (based on [2], for manner adverbs: [4]).

I will exemplify both approaches with the help of a simple example, the representation of (4).

(4)   Peter sings loudly.

The representation of (4) in a Davidsonian format is given in (5), while (6) gives the representation within the operator approach, without and with underlying events provided by the lexical entry of the verb, cf. (6-a) and (6-b), respectively.

(5) $\exists e[SING(p,e) \ \& \ LOUD(e)]$

(6)   a. $[LOUD(SING)(p)]$
        b. $\exists e[LOUD(SING)(p,e)]$

The semantic form of the manner adverb has the type $\ll e{<}e,t{\gg},{<}e{<}e,t{\gg\gg}$, regardless of the approach:

(7) $\lambda P\lambda x\lambda e[P(x,e) \ \& \ LOUD(e)]$ [Davidsonian]

(8) $\lambda P\lambda x\lambda e[LOUD(P)(x,e)]$ [Operator approach + events]

The two approaches to not equally well deal with the problems mentioned above, cf. figure 1.

Problems	Approach	
	Davidsonian	Operator
Contextsensitivity	Context Parameter	Context Parameter
Scope		$\sqrt{}$
Entailments	$\sqrt{}$	

Figure 1: Davidsonian vs. Operator approaches: A Short Comparison

Blanks in the table indicate that though a solution is not impossible, it does not fall straightaway from the chosen approach. I.e., the Davidsonian approaches can use additional parameters to express scope, Operator approaches meaning postulates to secure entailments.

2   A closer look: Underspecified Relations

When investigating the relationship between a manner adverb and the verbal predicate of a sentence, two types of underspecification can be distinguished: Either the relationship between the adverb and the action denoted by the verbal predicate is left open, or the manner adverb relates to an action not denoted by the verbal predicate. I will first look at the first phenomenon, which is essentially related to different subclasses of manner adverbs, and then discuss the second problem in the section on associative modification.

2.1 Subclasses of Manner Adverbs

When looking at manner adverbs, one can distinguish between pure manner adverbs, cf. (9), and agent-oriented manner adverbs, cf. (10).

(9)   Er hat **laut/schnell/wunderbar** gesungen. [Pure Manner Adverbs]
        He sang loudly/quickly/wonderfully.

(10)   Er hat sich **intelligent/geschickt** verteidigt. [Agent-Oriented Manner Adverbs]
        He defended himself intelligently/cleverly.

Note here that the same adverbs that can serve as agent-oriented adverbs are also possible with sentential readings, i.e. paraphrasable with *It was ADVERB (of the actor), that he did sth.* I do not consider these readings here.

While the operator approach says nothing about the relation between the manner modifier and the modified verbal predicate, one of the main advantages of the Davidsonian approach has been its intuitive appeal resulting from the claim that adverbial modifiers can be treated as predicates of events.

If we, again, rely on our intuition, then we immediately see that in the case of manner adverbs it is only for the pure manner adverbs that a predication over an event makes sense, not for the agent-oriented variants, cf. (11) and (12), respectively.

(11)   There is an event, which is a singing, which is loud.

(12)   ??There is an event, which is a defense, which is intelligent.

This contrasts with the very intuitive way in which local and temporal modifiers can be understood as predicates of events.

(13)   a.   He met his girfriend in Berlin.
        b.   There is a meeting-the-girlfriend- event, which is in Berlin.

(14)   a.   He met his girfriend yesterday.
        b.   There is a meeting-the-girlfriend- event, which took place yesterday.

However, even for PMAs the situation is not totally clear. I would like to demonstrate this by looking more closely at the interpretation of *loudly* as an adverb. Consider (15).

(15)   He played the development [of the sonata] loudly.

In my opinion, *loudly* can be interpreted in two ways in this sentences, cf. (16).

(16)   a.   READING A: *loudly* ≈ forte
        b.   READING B: *loudly* ≈ audibly

Forte refers to a certain manner of musical articulation, while *audibly* pertains to the global sound volume as perceived by the speaker. These readings are not totally independent of one another, since the manner of articulation has repercussions on the global sound volume of an event.

A possible solution to these data is to allow PMAs to be formalized as predicates of events when appropriate, while representing those instances of PMAs that do not directly predicate over the event as well as agent-oriented adverbs with the help of the

operator approach, cf. (17) for the two representations which disambiguate (15).

(17) a. $\exists e[Play(3sg,d,e) \ \& \ Loudly(e)]$
      b. $\exists e[Loudly(Play)(3sg,d,e)]$

2.2 Associative Readings

Cresswell, in discussing (18), makes the following observation:

> " [...] it could be argued that it is not the preceding which causes Isolde to be heard, but rather the fact that she is perhaps singing or doing something else; and it is the somethig else which is strictly the activity that is audible." [1, p. 187]

(18) Isolde **audibly** precedes Jeremy.
      =4 in [1, p. 186]

However, he notes that there are cases where the main verb itself is clearly responsible for the audibility, such as (19), which Cresswell argues "cannot mean simply that Kiri does something while singing which causes someone to hear her." Cresswell suspects that semantic considerations are at issue here: "For preceding and following are not usually *as such* the kind o things which are audible or not, it is the attendant activities. Whereas singing, at any rate, *is* intrinsically susceptible of being audible." [1, p. 186]

(19) Kiri sings **audibly**.
      =10 in [1, p. 188]

A more involved example of Cresswell's is (20), which he 'can even just imagine' to express a truth in a situation where Ludwig is a tap dancer who usually sings while dancing but not today.

(20) Ludwig danced silently but audibly.
      =12 in [1, p. 189]

In this case, *silently* should be applied to the associated activity of singing, whereas *audibly* is applied directly to the tap-dancing. Note though that this will turn out to be very difficult to formalize exactly, since the sentence *He sang silently* is already difficult if not impossible to process. That is, it is unclear to what *silently* is applied to if the intendend meaning is *He did not sing*, as on Cresswell's suggested reading.

Interestingly, the difference between adverb-verb combinations leading to associated readings and those that do not seems to be loosely related to whether or not the adverb can serve as a (proto-)typical answer to *How ...*- questions. If we ask *How did he sing the song?*, then *loudly, quietly etc.* are very likely answers, whereas in connection with *precede*, answers pointing to the means used are preferred, e.g. *on bikes, by car etc.*

Note that the associated readings although they are also concerned with the relation between the manner adverb and the verbal predicate cannot be compared with the difference in modifier-modified relations discussed in section 2.1. That is, for the different subclasses of manner adverbs it holds that their relationship to the verbal predicate differs, but in the case of associated readings, the adverb has strictly speak-

ing no relationship to the verbal predicate.

Do deal with this finding within the operator approach, Cresswell introduces a special operator which ensures that not the preceding as such is audible but some attentend activity is. His formalization of (20) is given in (21).

(21) $< Isolde, << ASS, audibly >, < \lambda, x, < precede, x, Jeremy >>>>$
        =8 in [1, p. 188]

The symbol ASS has the following value assignment:

(22)   V(ASS) is the function η in $D_{<<<0,1>,<0,1>>,<<0,1>,<0,1>>>}$ such that where $\zeta \in D_{<<0,1>,<0,1>>}, \omega \in D_{<0,1>}, a \in D_1$, and $<w,t> \in W$:
        $<w,t> \in ((\eta(\zeta))(\omega))(a)$ iff $<w,t> \in \omega(a)$, and there is some $\omega' \in D_{<0,1>}$ such that $< w,t> \in (\zeta(\omega'))(a)$.
        cf. [1, p. 187]; Cresswell's $<0, 1>$ corresponds translates into other approaches as $<t,e>$

In Cresswell's approach, the parsing of the sentence thus procedes as given in figure 2.
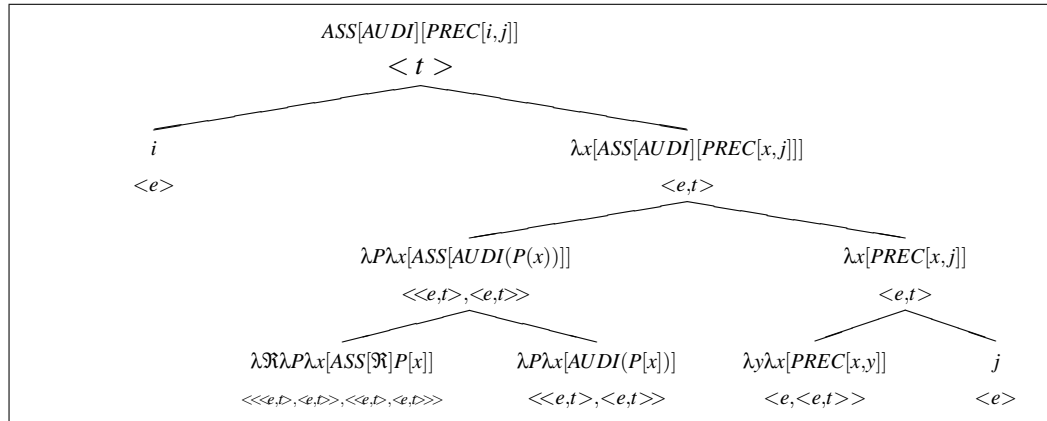

Figure 2: Parsing after Cresswell

Two points are noteworthy in this connection. Firstly, Cresswell gives no principled reason for the application of the operator (e.g. no type coercion or general principle of insertion). Secondly, and this is perhaps what weighs much more, it is not clear why the operator is applied to the adverb and not to the verbal predicate. Afterall, the activity which is modified is associated with the verbal predicate while the relation between adverb and this activity is pretty straightforward.

Again, I think that allowing adverbs such as *audibly* to be treated either as directly predicating over the event or to serve as operators on verb meaning allows to derive the wanted readings.

3   Conclusion

By concentrating on the problem of underspecification in manner modification, I have shown that with a combination of the operator and the conjunctive approach to adver-

bial modification greater descriptive adequacy can be acchieved in the formal analysis of manner adverbs. An open question here is whether or not the usage of a manner adverbs as predicates of events or as operators on verb meanings can be predicted with the help of grammatical and/or lexical information.

References

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