Modal Particles

Deriving Syntax from Semantics

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Introduction

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- Modal particles (MPs) in German form a small, more or less closed set of specific lexical items.

German modal particles (Hartmann 1998: 660)

(1) aber, auch, bloß, denn, doch, eigentlich, eben, etwa, einfach, erst, halt, ja, nun, mal, nur, schon, vielleicht, ruhig, wohl

- MPs share special syntactic and semantic properties which make them an interesting object for studying the syntax-semantics interface.
- Most formal approaches to MPs either focus on their syntax or semantics.
- The question of how their semantic and syntactic properties are connected to each other is not addressed directly.
- In this talk, I will try to establish some links between the semantics of MPs and their syntactic behavior.

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- The question of how their semantic and syntactic properties are connected to each other is not addressed directly.
- In this talk, I will try to establish some links between the semantics of MPs and their syntactic behavior.

- In previous work (Gutzmann 2008, 2009), I used the tools of Potts' (2005) logic of conventional implicatures to explicate these connections.
- Several studies have revealed some problems of that approach (Amaral et al. 2007; Gutzmann 2011; McCready 2010).
- In this talk, I will make use of Kubota & Uegaki's (2011) proposal to employ a continuation-based semantics (Barker & Shan 2008) to model multidimensional content.

- The list in (2) summarizes some of the syntactic and semantic properties commonly ascribed to modal particles.

Properties of MPs (cf. e.g. Autenrieth 2002: 29)

(2)
a. MPs are non-truth-conditional.
b. MPs have wide scope.
c. MPs are sentence mood dependent.
d. MPs cannot receive main stress.
e. MPs cannot be questioned.
f. MPs cannot occur in the so-called prefield (Germ. *Vorfeld*).

Aims for this talk:

1. Giving a multidimensional semantics for MPs to capture the fact that they do not contribute to the truth-conditional content of an utterance
2. Deriving as much of their syntactic properties as possible from that semantics

Multidimensional semantics for MPs

Continuation-based grammar

- Barker & Shan (2008) develop a semantics based on the idea of continuations in order to deal with quantifier scope and donkey anaphora.
- They use a categorial grammar in which syntactic and semantic information is decoded in lexical entries.

Syntactic and semantic information

(3)

(3)	DP	syntactic category
	David	expression
	david	semantic value

- In common cases, the syntactic composition works as expected.

Simple combination

(4) $\left(\begin{array}{cc} \text{DP} & \text{DP}\backslash\text{S} \\ \textit{David} & \textit{sleeps} \\ \mathbf{d} & \mathbf{sleep} \end{array}\right) = \begin{array}{c} \text{S} \\ \textit{David sleeps} \\ \mathbf{sleep\ d} \end{array}$

- 'Continuized' expressions like quantifiers have an additional layer on top of their syntactic and semantic part.

Continuation level of the universal quantifier

(5) $\dfrac{\mathrm{S}\,|\,\mathrm{S}}{\mathrm{DP}}$ *everyone* $\dfrac{\forall y.[\,]}{y}$

Continuized categories

(6) $\dfrac{\mathrm{S}\,|\,\mathrm{S}}{\mathrm{DP}}$ means $\dfrac{\text{...to form an S.} \;|\; \text{and takes scope at an S...}}{\text{The expression functions in local syntax as a DP,}}$

Combination of continuized expressions

(7) $$\left(\begin{array}{cc} \frac{C \mid D}{A/B} & \frac{D \mid E}{B} \\ \textit{left-exp} & \textit{right-exp} \\ \frac{g[\,]}{f} & \frac{h[\,]}{x} \end{array}\right) = \begin{array}{c} \frac{C \mid E}{A} \\ \textit{left-exp right-exp} \\ \frac{g[h[\,]]}{f(x)} \end{array}$$

Type shifters

(8) $$\begin{array}{c} A \\ \textit{expression} \\ x \end{array} \overset{\text{Lift}}{\Rightarrow} \begin{array}{c} \frac{B \mid B}{A} \\ \textit{expression} \\ \frac{[\,]}{x} \end{array}$$

(9) $$\begin{array}{c} \frac{A \mid B}{B} \\ \textit{expression} \\ \frac{[\,]}{x} \end{array} \overset{\text{Lower}}{\Rightarrow} \begin{array}{c} A \\ \textit{expression} \\ x \end{array}$$

where $B \in \{S, Assn\}$

- Kubota & Uegaki (2011) use the category Ass to ensure that expressives are contuinized until a sentence is uttered.
- This accounts for their scoping behavior.

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$$\left(\begin{array}{cc} \frac{C \mid D}{A/B} & \frac{D \mid E}{B} \\ \textit{left-exp} & \textit{right-exp} \\ \frac{g[\,]}{f} & \frac{h[\,]}{x} \end{array} \right) = \begin{array}{c} \frac{C \mid E}{A} \\ \textit{left-exp right-exp} \\ \frac{g[h[\,]]}{f(x)} \end{array}$$

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Continuation semantics for MPs

- To account for the non-truth-conditional meaning of MPs, we need another semantic dimension.
- This dimension is introduced in the continuation level of expressives.

(10) $\dfrac{\langle [\,], \mathit{Exp} \rangle}{\mathit{Desc}}$ expressive dimension / descriptive/at-issue dimension

- The syntactic category is such that the evaluation of the expressive is delayed to the level of assertion.

(11) $\dfrac{\mathrm{Ass} \mid \mathrm{Ass}}{\mathrm{B}}$

- To account for the default position of MPs in German main clauses, I make the (simplifying) assumption that they are modifiers on VPs.

Syntactic category for MPs

(12) $(\mathrm{DP}\backslash\mathrm{S})\Big\backslash\left(\mathrm{DP}\Big\backslash\dfrac{\mathrm{Ass}\,|\,\mathrm{Ass}}{\mathrm{S}}\right)$

- They combine with a VP to their left to yield a VP with an Ass-type continuation.
- Semantically, they introduce content in the expressive dimension but pass their descriptive arguments unmodified to the descriptive dimension.

Semantic value for MPs

(13) $\lambda P \lambda x.\dfrac{\langle [\,], \mathbf{MP}(P\,x)\rangle}{P\,x}$

Lexical entry for the MP *halt*

(14)

$$(\mathrm{DP}\backslash \mathrm{S})\Big\backslash\left(\mathrm{DP}\Big\backslash \frac{\mathrm{Ass}\,|\,\mathrm{Ass}}{\mathrm{S}}\right)$$ continuized VP modifier

halt

$$\lambda P \lambda x.\ \frac{\langle [\,], \mathbf{halt}(P(x))\rangle}{P(x)}$$ continuized multidimensional semantics

- In order to derive a simple sentence, we need the additional assertion rule used by Kubota & Uegaki (2011: 317) to shift a sentence to an assertion.

Assertion rule

(15)

S	Assert	Ass
expression	$\Rightarrow$	*expression*
ϕ		ϕ

$$\left(\begin{array}{c} DP\backslash S \\ \textit{schläft} \\ \textbf{sleep} \end{array} \quad \begin{array}{c} (DP\backslash S)\Big\backslash\Big(DP\Big\backslash\dfrac{Ass\,|\,Ass}{S}\Big) \\ \textit{halt} \\ \lambda P\lambda x.\,\dfrac{\langle[\,],\textbf{halt}(P\,x)\rangle}{P\,x} \end{array}\right) = \begin{array}{c} DP\Big\backslash\dfrac{Ass\,|\,Ass}{S} \\ \textit{schläft halt} \\ \lambda x.\,\dfrac{\langle[\,],\textbf{halt}(\textbf{sleep}\,x)\rangle}{\textbf{sleep}\,x} \end{array}$$

$$\left(\begin{array}{c} DP \\ \textit{David} \\ \textbf{d} \end{array} \quad \begin{array}{c} DP\Big\backslash\dfrac{Ass\,|\,Ass}{S} \\ \textit{schläft halt} \\ \lambda x.\,\dfrac{\langle[\,],\textbf{halt}(\textbf{sleep}\,x)\rangle}{\textbf{sleep}\,x} \end{array}\right) = \begin{array}{c} \dfrac{Ass\,|\,Ass}{S} \\ \textit{David schläft halt} \\ \dfrac{\langle[\,],\textbf{halt}(\textbf{sleep d})\rangle}{\textbf{sleep d}} \end{array}$$

$$\begin{array}{c} \dfrac{Ass\,|\,Ass}{S} \\ \textit{David schläft halt} \\ \dfrac{\langle[\,],\textbf{halt}(\textbf{sleep d})\rangle}{\textbf{sleep d}} \end{array} \overset{\text{Assert}}{\Rightarrow} \begin{array}{c} \dfrac{Ass\,|\,Ass}{Ass} \\ \textit{David schläft halt} \\ \dfrac{\langle[\,],\textbf{halt}(\textbf{sleep d})\rangle}{\textbf{sleep d}} \end{array} \overset{\text{Lower}}{\Rightarrow} \begin{array}{c} Ass \\ \textit{David schläft halt} \\ \langle\textbf{sleep d},\textbf{halt}(\textbf{sleep d})\rangle \end{array}$$

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Deriving the properties

Properties of MPs

(16)
a. MPs are non-truth-conditional. ✓
b. MPs have wide scope. ✓
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d. MPs cannot receive main stress.
e. MPs cannot be questioned.
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Sentence mood dependence

(17) a. *Schläft David halt?
sleeps David MP

b. *David schläft denn.
David sleeps MP

- As long as the sentence mood is represented in the derivation, the restrictions are directly accounted for by the lexical entries.
- Even if the entries can be lifted to be combined with each other, the tower cannot be lowered at the end of the derivation to yield an interpretable structure.

(18)

Ass	Ass
Q	Q

S

Schläft David halt?

$\langle [\,], \textbf{halt}(\textbf{sleep d}) \rangle$

[]

?sleep d

MPs cannot receive main stress

- That MPs cannot receive main stress is based on the fact that they cannot be focused.
- Assuming a standard alternative semantics for focus, this can be derived from the multidimensional semantics.
- The only assumption needed is that the focus interpretation operator $\sim C$ is attached at sentential level, which seems reasonable anyway (Rooth 1996).

Lexical entries for the focus operator and the focus accent

(19)
$$\begin{array}{c} \mathrm{S}\backslash\mathrm{S} \\ \varnothing \\ \lambda X.X \sim C \end{array}$$

Derivation of **David schläft HALT*

(20)

	DP	DP\S	$(\mathrm{DP}\backslash\mathrm{S})\Big\backslash\Big(\mathrm{DP}\Big\backslash\frac{\mathrm{Ass}\mid\mathrm{Ass}}{\mathrm{S}}\Big)$	S\S
(20)	*David*	*schläft*	*HALT*	∅
	d	**sleep**	$\lambda P\lambda x.\dfrac{\langle[\,],\mathbf{halt}_{\mathrm{F}}(P\,x)\rangle}{P\,x}$	$\lambda X.X \sim C$

Derivation of **David schläft HALT*

	DP	$DP\backslash\frac{Ass \mid Ass}{S}$	$S\backslash S$
(20)	*David*	*schläft HALT*	$\varnothing$
	$\mathbf{d}$	$\lambda x.\dfrac{\langle [\,], \mathbf{halt}_F(\mathbf{sleep}\,x)\rangle}{\mathbf{sleep}\,x}$	$\lambda X.X \sim C$

Derivation of **David schläft HALT*

(20)

$$\dfrac{\dfrac{\dfrac{\text{Ass} \mid \text{Ass}}{\text{S}} \quad \text{S}\backslash\text{S}}{}}{}$$

	Ass | Ass	
	S	S\S
(20)	*David schläft HALT*	∅
	$\langle [\,], \mathbf{halt}_F(\mathbf{sleep\ d})\rangle$	$\lambda X.X \sim C$
	sleep d	

Derivation of **David schläft HALT*

(20)

$$\dfrac{\dfrac{\dfrac{\text{Ass}\mid\text{Ass}}{\text{S}}}{\textit{David schläft HALT}}}{\dfrac{\langle [\,], \textbf{halt}_F(\textbf{sleep d})\rangle}{\textbf{sleep d}}} \qquad \dfrac{\dfrac{\dfrac{\color{red}{\text{Ass}\mid\text{Ass}}}{\text{S}\backslash\text{S}}}{\varnothing}}{\dfrac{\color{red}{[\,]}}{\lambda X.X \sim C}}$$

Derivation of **David schläft HALT*

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$$\dfrac{\dfrac{\text{Ass} \mid \text{Ass}}{\text{S}}}{\dfrac{\begin{array}{c}\textit{David schläft HALT}\ \varnothing \\ \langle [\,], \mathbf{halt}_F(\mathbf{sleep\ d})\rangle\end{array}}{[\mathbf{sleep\ d}] \sim C}}$$

Derivation of **David schläft HALT*

(20)

$$\dfrac{\dfrac{\text{Ass} \mid \text{Ass}}{\text{Ass}}}{}$$

David schläft HALT ∅

$$\dfrac{\langle [\,], \mathbf{halt}_F(\mathbf{sleep\ d}) \rangle}{[\mathbf{sleep\ d}] \sim C}$$

Derivation of **David schläft HALT*

(20)

Ass

David schläft HALT $\varnothing$

$\langle [\textbf{sleep d}] \sim C, \textbf{halt}_F(\textbf{sleep d})\rangle$

Focus interpretation rule (Rooth 1996: 279)

(21) Where ϕ is a syntactic phrase and C is a syntactically covert semantic variable, $\phi \sim C$ introduces the presupposition that C is a subset of $[\![\phi]\!]^f$ containing $[\![\phi]\!]^o$ and at least one other element.

Focus interpretation rule (Rooth 1996: 279)

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Presuppositions of (20)

(22) [**sleep d**] $\sim C_n$ presupposes that …

a. $C \subseteq [\![\textbf{sleep d}]\!]^f$ and

b. $[\![\textbf{sleep d}]\!]^o \in C$ and

c. C contains at least one further element besides $[\![\textbf{sleep d}]\!]^o$.

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Presuppositions of (20)

(22) $[$**sleep d**$] \sim C_n$ presupposes that …

a. $C \subseteq \{$*David sleeps*$\}$ and

b. *David sleeps* $\in C$ and

c. C contains at least one further element besides *David sleeps*.

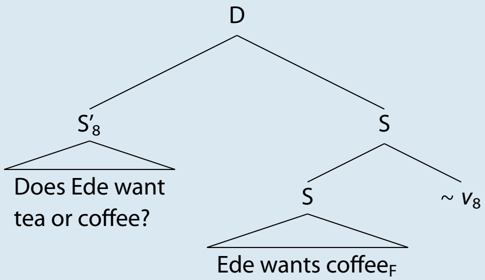
- The three presuppositions cannot be satisfied at the same time.
- Focus accent of an MP will always yield unfulfilled presuppositions and is therefore not allowed.

MPs cannot be questioned

(23) *Wie schläft David? (David schläft halt)
how sleeps David *David sleeps MP*

- Rooth (1996) gives an account on questions that relies on focus interpretation.
- A question explicitly sets the value for the variable *C* that gets introduced by the focus interpretation operator ∼ in the answer.

(24)



- As we have just seen, a focus feature on an MP cannot be found by the focus interpretation operator.

(25) Ass
David schläft HALT $\varnothing$
$\langle [\textbf{sleep d}] \sim C, \textbf{halt}_F(\textbf{sleep d}) \rangle$

- A question about an MP therefore never has a felicitous answer.

➡ MPs cannot be questioned.

MPs cannot occur in the 'prefield'

(26) *Halt schläf Peter.
MPs sleeps Peter

- There are specific conditions under which an expression can occur in the prefield (≈ CP,spec).
- For an expression to occur in the prefield (the position commonly associated with CP,spec), specific conditions have to hold.

Conditions to occur in to prefield in German (Steinbach 2002: 162)

1. The first argument of the unmarked word order (in the middle field) can occupy CP,spec.
2. The focus can occupy CP,spec.
3. The topic can occupy CP,spec.
4. [Further conditions on discourse referents]

- As already argued, MPs cannot be the focus of the sentence.
- They cannot be the topic either, since it is built on the notion of focus (Büring 1997).
- They are not the first element of the unmarked word order: they typically appear after the subject at the left edge of VP.
- They also do not introduce discourse referents.

⇒ MPs cannot occur in the prefield.

Conclusion

Properties of MPs

(27)
a. MPs are non-truth-conditional. ✓
b. MPs have wide scope. ✓
c. MPs are sentence mood dependent. ✓
d. MPs cannot receive main stress. ✓
e. MPs cannot be questioned. ✓
f. MPs cannot occur in the so-called prefield (Germ. *Vorfeld*). ✓

Conclusion

- I have given a continuation semantics for MPs that implements their non-truth-conditional meaning.
- From this semantics, their sentential scope directly follows.
- Furthermore, this semantics allows for deriving many of their syntactic features, relying only on independently motivated analysis of other linguistic phenomena.
- Further research will show whether even more syntactic properties of MPs or other expressions can directly be accounted for by such a semantics.

Thank you for your attention!

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