

# Aspects of prosodic phrasing of pronouns in German

Frank Kügler

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“Prosody of Pronouns”  
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# Overview

- In general, prosodic light elements are unaccented.
- Pronouns are prosodic light elements.
- What are the conditions for phrasing of pronouns?
- A pitch accent represents a head of a phonological phrase.
- Optional accentuation of pronouns in German.
- Analysis in terms of minor phrase stress (Kratzer & Selkirk 2007) or recursive prosodic phrasing.
- Pitch accents on pronouns usually bear less prominent accents than obligatory sentence accents.
- **How can we model it?**

# Background

## Pronouns and prosodic phrasing (cf. Selkirk 1996)

- Fundamental division between lexical words and function words.
- Prosodic characteristics:

	Function words	Lexical words
English	stressless “weak” form, or stressed “strong” form	stressed and unreduced form
Croatian	no high tone accent	lexical high tone accent
Japanese	may lose its high tone word accent	high tone word accent

## Background

- “Options in the surface prosodization of function words simply reflect the manner in which function words are organized into *prosodic words* in the sentence.” (Selkirk 1996:188)

(1) Prosodic word:  $((\text{fnc})_{\omega} (\text{lex})_{\omega})_{\varphi}$   
 Prosodic clitic:  $(\text{fnc} (\text{lex})_{\omega})_{\varphi} / ((\text{fnc lex})_{\omega})_{\varphi} / ((\text{fnc} (\text{lex})_{\omega})_{\omega})_{\varphi}$

- Selkirk’s claim:  
 The type of prosodic representation of a function word in a given language depends on the interaction of (well-attested) constraints on prosodic structure formation.

# Background

- Prosodic structure formation of function words in Serbian depends on its size (Zec 2002:214):
  - Disyllabic function words receive  $\omega$ -status, monosyllabic function words not.
- Strong and weak pronouns have different prosodic effects:
  - Rightward displacement of certain kinds of pronouns in Irish (Bennett, Elfner & McCloskey 2016).
  - Weak pronouns in the Austronesian language Chamorro occur right after the predicate, i.e. after the leftmost phonological phrase of their intonational phrase (Chung 2003).
- Prosodic realization of function words varies according to Selkirk's (1996) typology.

# Background

## Prosodic structure formation in German

(Féry & Samek-Lodovici 2006, Truckenbrodt 2006, Féry 2011):

- Formation of prosodic phrases ( $\varphi$ -phrase and  $\iota$ -phrase) – based on universal syntax-phonology interface constraints (cf. Selkirk 2011).
- Assignment of sentence accents on the head of a  $\varphi$ -phrase.
- One nuclear accent within  $\iota$ -phrase (main accent of the sentence).

(2) a. [<sub>CP</sub> [<sub>NP</sub> MARIA<sub>1</sub>] hat [<sub>TP</sub> t<sub>1</sub> [<sub>VP</sub> [<sub>VP</sub> [<sub>NP</sub> ein BUCH] gekauft ] ] ] ]  
 b. ( ( MARIA )<sub>φ</sub> ( hat ( ein BUCH )<sub>φ</sub> gekauft )<sub>φ</sub> )<sub>ι</sub>

(3) ( x )<sub>ι</sub>  
 ( x )<sub>φ</sub> ( ( x )<sub>φ</sub> )<sub>φ</sub>  
 ( x )<sub>ω</sub> ( x )<sub>ω</sub> ( x )<sub>ω</sub>  
 MARIA hat ein BUCH gekauft.

(Adapted from Féry 2011:1907)

# Background

## Prosodic structure formation in German

(Féry & Samek-Lodovici 2006, Truckenbrodt 2006, Féry 2011):

- Pronouns in German do not carry sentence stress:

Pronouns fail to be phrased as a  $\varphi$ -phrase (Kratzer & Selkirk 2007)

(4) (MARIA) <sub>$\varphi$</sub>  (hat *was* geKAUFT) <sub>$\varphi$</sub>

Presence of object pronoun may lead to alternation in verb accentuation  
(Truckenbrodt 2012)

- (5) a. Am Dienstag hat *ihn* ein Kunde geklaut.  
 b. Am Dienstag hat *ihn* ein Kunde geklaut.  
 'On Tuesday a customer has stolen it.'

(Truckenbrodt 2012:491, underlining = stress)

# Background

## Pitch accent as head of $\varphi$ -phrase

- “presence of pitch accents reflects patterns of phrase stress” (Kratzer & Selkirk 2007:94; cf. Ladd 1996; Féry and Samek-Lodovici 2006; Selkirk 2006)
  - However, “ACCENT” is not like “accent”
    - Usually, sentence accent or nuclear accent is discussed (CAPITALS / underlining).
    - Pre-nuclear or rhythmically determined accents (Calhoun 2010).
    - Pitch accents have different inherent prominences (Baumann & Röhr 2015).
  - Kratzer & Selkirk 2007: major vs. minor phrase stress.
    - Major phrase stress in obligatory position.
    - Minor phrase stress in non-obligatory position.
- (6) MARIA studiert/STUDIERT die GESETZE.  
 ‘Mária is studying/stúdying the láws.’ (Kratzer & Selkirk 2007:94)
- Accented pronouns in German in spontaneous speech (Zerbian & Böttcher 2019)
    - Factors: prosodic well-formedness ‘headed IPs’, syntactic constituency (PPs)
    - accented pronouns: “a peculiar but widespread phenomenon of German” (p.2641)



# Research questions

- What are the conditions for prosodic phrasing of pronouns in German?

(Q1): Are pronouns generally left unaccented in German?

- No! Pronouns in German may carry an accent (Kügler 2018; Zerbian & Böttcher 2019; see also Bögel, this workshop for weak and strong pronouns in Swabian)
- Focused pronouns usually carry an accent.
- Tendency for accented pronouns if (i) disyllabic, (ii) occurrence in the *Mittelfeld*, (iii) the only head in an  $\tau$ -phrase, and (iv) as complements in PPs

(Q2): How are pronouns phrased prosodically –  $\omega$ , or head of  $\varphi$ ?

(Q3): How to account for optional, “minor phrase stress”?

# Empirical study (Kügler 2018)

## Speakers

- Ten (5f / 5m) native speakers of German in their twenties received course credits.

## Recording procedure

- sound-proof chamber equipped with an AT4033a audiotechnica studio microphone, using a C-Media Wave sound card at a sampling rate of 44.1 kHz with 16 bit resolution.
- Repetitions of hesitations or false starts.
- Presentation flow was controlled by the experimenter (25 min).

## Speech materials

- Recording of read speech (context and target sentence, n=180).
- Control of information status and size of pronoun.

## Empirical study – Speech materials

- (7) C: Warum freust du dich? *‘Why are you so happy?’*
- a. Ich weiß, dass Maria **ihrer Freundin** ein Buch geschenkt hat.  
*‘I know that Maria gave a book to her friend as a present.’*
  - b. Ich weiß, dass Maria **ihr** ein Buch geschenkt hat.  
*‘I know that Maria gave her a book as a present.’*
  - c. Ich weiß, dass Maria **ihnen** ein Buch geschenkt hat.  
*‘I know that Maria gave them a book as a present.’*
- (8) C: Warum freust du dich? *‘Why are you so happy?’*
- a. Ich glaube, dass ein Junge eine Geige **an einen Freund** schickte.  
*‘I think that a boy sent a violin to friend.’*
  - b. Ich glaube, dass ein Junge **ihr** eine Geige schickte.  
*‘I think that a boy sent her a violin.’*
  - c. Ich glaube, dass ein Junge **ihnen** Geigen schickte.  
*‘I think that a boy sent them violins.’*

## Empirical study – Speech materials

- (9) C1: Warum ist es hier so ruhig? *‘Why is it so quiet here?’*
- a. Die Schüler wurden von **einer Lehrerin** nach Hause geschickt.
  - b. Die Schüler wurden nach Hause geschickt von **einer Lehrerin**.  
*‘The students were sent home by a teacher.’*
  - c. Die Schüler wurden von **ihr** nach Hause geschickt.
  - d. Die Schüler wurden nach Hause geschickt von **ihr**.  
*‘The students were sent home by her.’*
- (10) C1: Warum ist es hier so ruhig? *‘Why is it so quiet here?’*
- a. Die Schüler wurden von **Lehrerinnen** nach Hause geschickt.
  - b. Die Schüler wurden nach Hause geschickt von **Lehrerinnen**.  
*‘The students were sent home by teachers.’*
  - c. Die Schüler wurden von **ihnen** nach Hause geschickt.  
Die Schüler wurden nach Hause geschickt von **ihnen**.  
*‘The students were sent home by them.’*
- C2: Was hat die Lehrerin gemacht? *‘Why is it so quiet here?’*

## Empirical study – Results

General results on the distribution of sentence accents  
(all expected and not surprising):

- NPs containing lexical words receive full accents  
(→ subject and objects).
- Variation of pitch accent types both within and between speakers  
(→ different pitch contours).
- Some variation on verb accentuation  
(cf. (5), Kratzer & Selkirk 2007, Féry & Kügler 2008, Truckenbrodt 2012).

# Empirical study – Results on accentuation

- Focus caused more accented pronouns.

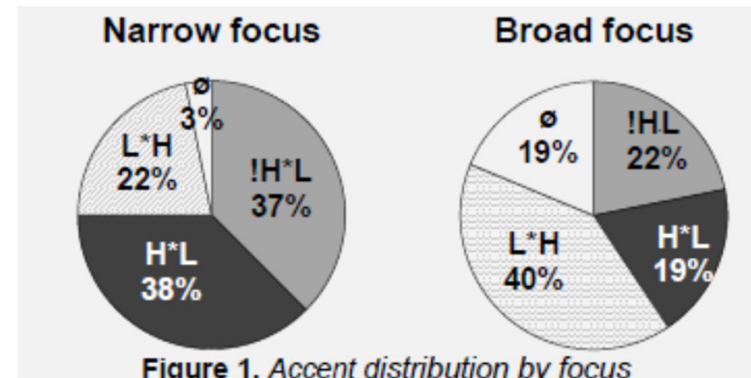


Figure 1. Accent distribution by focus

- Disyllabic pronouns were more often accented.

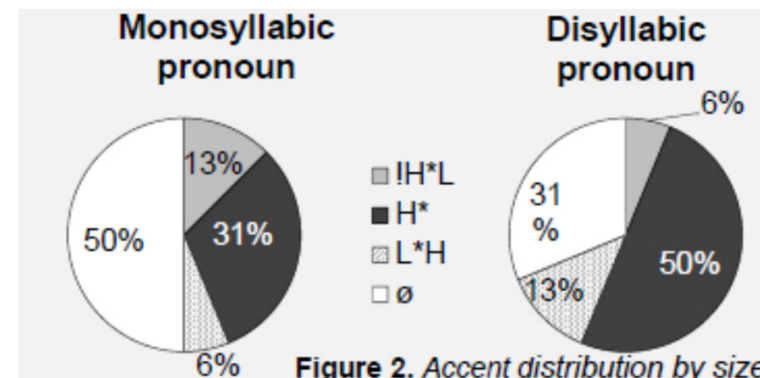


Figure 2. Accent distribution by size

- Pronouns in the *Mittelfeld* were more often accented

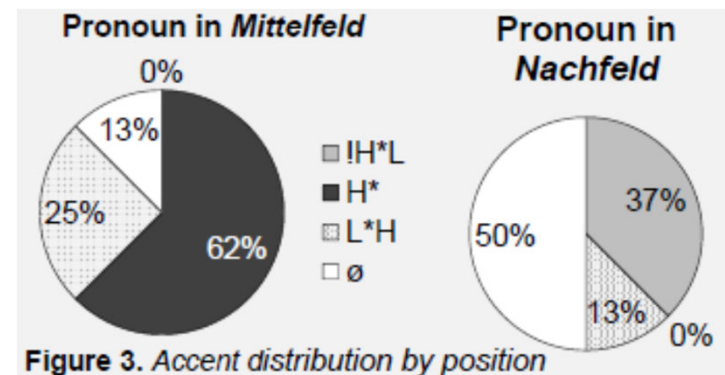


Figure 3. Accent distribution by position

# Empirical study – Results on prominence

## Procedure:

- DIMA annotation (Kügler et al. 2021)
- Prominence tier: three levels of perceived prominence (1 = weak, 2 = strong, 3 = emphasis)

- More prominence 2 ratings in disyllabic pronouns.
- More prominence 2 ratings in *Mittelfeld* pronouns.

	Monosyllabic		Disyllabic	
Accent	1	2	1	2
!H*L	6%	6%	-	6%
H*	44%	-	13%	38%
L*H	6%	-	-	13%
∅	38%		30%	
Total	100%		100%	

	<i>Mittelfeld</i>		<i>Nachfeld</i>	
Accent	1	2	1	2
!H*L	-	-	12%	25%
H*	38%	25%	-	-
L*H	-	25%	13%	-
∅	12%		50%	
Total	100%		100%	

# Discussion

(Q1): Are pronouns generally left unaccented in German?

- No!
- Pronouns may carry a pitch accent (60 – 80% of the cases); depending on size and position.
- Comparing accent type on full NP constituent in the same position:  
NP – L\*H (95%) / Pronoun – H\* (~65%)
- In 20 - 40% of the cases, the pronoun has no accent.
- Results on read speech confirmed by data from spontaneous speech (Zerbian & Böttcher 2019).
- Considerable variation to take into account for prosodic phrasing.



# Discussion

(Q2): How are pronouns phrased prosodically, if accented – do they constitute a prosodic word, and/or do they form a prosodic head of a  $\varphi$ -phrase?

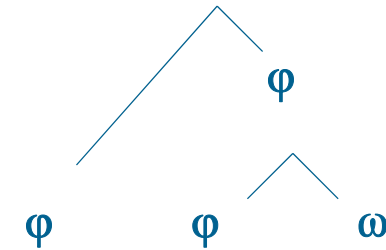
- The presence of an accent may speak in favour of the presence of a  $\varphi$ -phrase (cf. Kratzer & Selkirk 2007, Ladd 1996; Féry and Samek-Lodovici 2006; Selkirk 2006).
- However, the proposal of **minor and major prosodic phrases**, and thus the **distinction between obligatory and optional pitch accents** may be more appealing to account for the accent patterns on pronouns in German (cf. Kratzer & Selkirk 2007).

# Discussion – Phrasing

(11)

X	X	
X	X	X
X	X	X

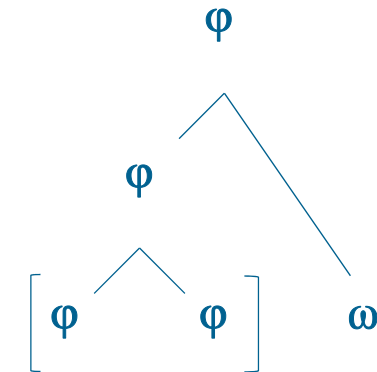
( (von einer (Lehrerin)<sub>ω</sub> )<sub>φ</sub> ( (nach (Hause)<sub>ω</sub> )<sub>φ</sub> (geschickt)<sub>ω</sub> )<sub>φ</sub> )<sub>φ</sub>



(12) a.

(x)	X	
X	X	X
X	X	X

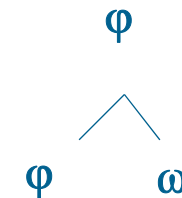
( ( (von (ihr)<sub>ω</sub> )<sub>φ</sub> (nach (Hause)<sub>ω</sub> )<sub>φ</sub> )<sub>φ</sub> (geschickt)<sub>ω</sub> )<sub>φ</sub>



b.

X	
X	X
X	X

( (von ihr nach (Hause)<sub>ω</sub> )<sub>φ</sub> (geschickt)<sub>ω</sub> )<sub>φ</sub>



## Discussion – Phrasing

(12) a.

		x		
	(x)	x		
	x	x		x
(	(	(von (ihr)ω )φ	(nach (Hause)ω )φ )φ	(geschickt)ω )φ

- “But there are other pitch accents – in English, Dutch, German, and other languages – which have no particular meaning contribution. These pitch accents appear to be epenthetic tonal elements whose function, if any, is to enhance the head of a prosodic constituent.” (Kratzer & Selkirk 2007: 128)
  - I would propose that these pitch accents appear optionally on pronouns in German if these are prosodically phrased as a prosodic word.
  - However, how to model the optional, minor phrase stress? (Q3)

# Discussion – Syntax-Phonology Mapping

- Match Theory (Selkirk 2011)
  - MatchClause: CP  $\leftrightarrow$   $\iota$ -phrase
  - MatchPhrase: XP  $\leftrightarrow$   $\varphi$ -phrase
  - MatchWord: LexW  $\leftrightarrow$   $\omega$
  
- Lexical category condition (Truckenbrodt 1999:226; see also Nespor & Vogel 1986, Selkirk 1984)
  - “Constraints relating syntactic and prosodic categories apply to lexical syntactic elements and their projections, but not to functional elements and their projections, or to empty syntactic elements and their projections.
  - “lexical category words are standardly parsed as prosodic words (w), while functional category words like determiners, complementizers, prepositions, auxiliary verbs, and so on - in particular the monosyllabic versions of these - are not” (Selkirk 2011:453)
  
- Prosodic constraints
  - Stress- $\varphi$ : Assign phrasal stress in a  $\varphi$ -phrase (see “Stress-XP”, e.g. Truckenbrodt 1999)
  - Stress-Foc: “A focused phrase has the highest prosodic prominence in its focus domain.”
  - DestressGiven: A given phrase is prosodically nonprominent. (Féry & Samek-Lodovici 2006:135)

# Discussion – Syntax-Phonology Mapping

- What is the role of function words then?

If function words have a strong and a weak form (see Selkirk 1996):

Strong form projects  $\omega$ , weak form only  $\sigma$

e.g. Swabian strong [i:] vs weak [ə] (Bögel, this workshop)

Option (1): strong and weak form of 3<sup>rd</sup>SG pronouns

MatchWord: (13a)

/ihn/strong	MatchWord
☞ (ihn) $\omega$	
(ihn) $\sigma$	*!

(13b)

/ihn/weak	MatchWord
(ihn) $\omega$	*!
☞ (ihn) $\sigma$	

If the strong form matches  $\omega$ , it can be the head of  $\varphi$

However:

[ $\pm$  accent] on pronouns 'ihn/ihnen' provides no evidence for strong/weak distinction.

Other evidence?


## Discussion – Syntax-Phonology Mapping

- What is the role of function words then?

Assumption: pronouns (in Standard German) have no strong/weak distinction.

- Option (2):

MatchWord does not apply to pronouns (see Lexical Category Condition)

(14)	/ihn/	MatchWord	Stress- $\varphi$
	(ihn) $\omega$	*!	
	 (ihn) $\sigma$		

- Stress- $\varphi$  cannot apply since the pronoun cannot be the head of  $\varphi$
- Phrasing of a pronoun in its own phrase requires a prosodic well-formedness constraint
- Proposal: RHYTHM (according to Calhoun 2010)  
(in terms of \*Lapse, \*Clash)

# Discussion – Syntax-Phonology Mapping

- What is the role of function words then?
  - Option (2):
    - Proposal: RHYTHM (according to Calhoun 2010)

(15) What happened?  

$$\begin{array}{cccc} & & & * \\ & & * & * \\ * & * & * & * \\ ([Arun's\ friend\ bought\ an\ Alfa\ Romeo])_F \end{array}$$

“the prenuclear region would then be too long without a stress on the second tier of the grid. Therefore, a purely rhythmic stress would be ‘added’ on *friend*.” (Calhoun 2010: 16)

- Similarly, the prenuclear region would be too long in (16) and could optionally receive a phrasal stress

(16) (
$$\begin{array}{l} \quad \quad \quad \quad \quad x \quad )_{\iota} \quad \text{MatchClause} + \text{Stress-Foc} \\ \quad \quad \quad ( \quad \quad \quad x \quad )_{\phi} \quad ( \quad \quad \quad \mathbf{x} \quad )_{\phi} \quad x \quad )_{\phi} \quad \text{MatchPhrase} + \text{Effect of RHYTHM} \\ \quad \quad \quad ( \quad \quad \quad x \quad )_{\omega} \quad ( \quad \quad \quad \mathbf{x} \quad )_{\omega} \quad x \quad )_{\omega} \quad \text{MatchWord} \end{array}$$

[Die Intendantin ist von ihnen begeistert.]<sub>F</sub>  
 ‘The director is excited about them.’

# Discussion – Syntax-Phonology Mapping

- What is the role of function words then? **What is the role of optionality then?**

– Option (2):

(16) (                    x                    )<sub>ι</sub> MatchClause + Stress-Foc  
       (                    x                    )<sub>φ</sub> (                    x                    )<sub>φ</sub> x                    )<sub>φ</sub> MatchPhrase + Effect of RHYTHM  
       (                    x                    )<sub>ω</sub> (                    x                    )<sub>ω</sub> x                    )<sub>ω</sub> MatchWord

[Die Intendantin ist von ihnen begeistert.]<sub>F</sub>

‘The director is excited about them.’



Optional accentuation (Kratzer & Selkirk 2007:94)

(6) **MARIA** studiert/STUDIERT die GESETZE.  
 ‘Mária is studying/stúdying the láws.’

(For rhythm effects on pronouns placement see also Franz, Bader & Kentner, 2021; rhythm at ω-level)

**However:**

How to implement optionality in OT?

- multiple outputs by reranking of constraints (see e.g. Anttila 1997)
- Other ideas?



# Discussion – Syntax-Phonology Mapping

- **What is the role of optionality then?**

**However:**

How to implement optionality in OT?

- multiple outputs by reranking of constraints (see e.g. Anttila 1997)
- Other ideas?

(17a)

/ist von ihnen begeistert/	RHYTHM	DESTRESSGIVEN
(ist von ihnen (beGEIstert) <sub>ω</sub> ) <sub>φ</sub>	*!	
☞ (ist von (IHnen) <sub>ω</sub> (beGEIstert) <sub>ω</sub> ) <sub>φ</sub>		*



(17b)

/ist von ihnen begeistert/	DESTRESSGIVEN	RHYTHM
☞ (ist von ihnen (beGEIstert) <sub>ω</sub> ) <sub>φ</sub>		*
(ist von (IHnen) <sub>ω</sub> (beGEIstert) <sub>ω</sub> ) <sub>φ</sub>	*!	

# Conclusions

- Syntax-Phonology-Mapping is not a simple matter of presence or absence of pitch accents in German.
- Prosodically light elements such as pronouns may receive an accent.
- These accents may
  - be interpreted as “epenthetic” (cf. Kratzer & Selkirk 2007),
  - carry less prominence than bitonal rising or falling accents (cf. Baumann & Röhr 2015).
- “ACCENT” is thus not like “accent”.
- Pronouns are optionally phrased as prosodic words. If so, they carry an optional and less prominent pitch accent.
- **How to implement optionality in OT remains for further study.**

Vielen Dank !

Thank you !

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