# Prosodic marking of givenness in Czech

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# Outline

(1)   a.   *What happened?*        b.   *What about Pavel?*
           Marie viděla Pavla.          Pavla viděla Marie.

Common observation: word order options in Czech are influenced by information structure.

Question

How exactly is word order in Czech linked to information structure?

Our answer

The crucial constraint concerns how IS is mapped to prosody: **given** elements must not carry **sentence stress**.

# Previous approaches
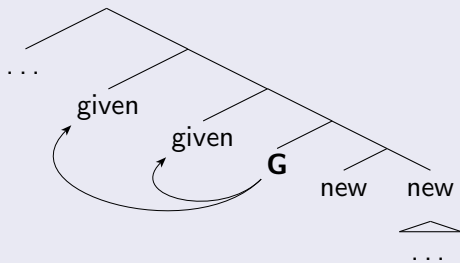
## Czech linguistic (functionalist) tradition

Communicative dynamism (Firbas 1957, 1992) governs word order, in that **less dynamic** (familiar, discourse old, functional) expressions tend to **precede more dynamic** (new, contrastive, lexically rich) expressions, see also e.g. Mathesius (1939).

$$\boxed{\text{word order}} \leftrightarrow \boxed{\text{information structure}}$$

# Previous approaches

## Recent formalization

Kučerová (2007, 2012) formalized the idea of a given-new-partition in Czech within a modern generative framework. She argued for a **"G-operator"** that marks elements in its scope as given and thus divides the structure into a **given and a new part**.



$\rightarrow$ Is scrambling a result of this partitioning requirement?

# Prosodic approach

## Alternative view: prosody as the crucial factor

A clash between principles of **prosody-IS-mapping** and **prosody-word-order-mapping** causes word order variation, e. g.:
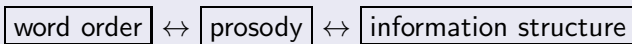
- **Zubizarreta (1998) for Spanish:**
  Rule 1: Put sentence stress on the focus.
  Rule 2: Put sentence stress on the rightmost element.
  $\rightarrow$ Results in a conflict if the focus is not rightmost.
  $\rightarrow$ Solution: Move the focused element to the right periphery.

  | word order | $\leftrightarrow$ | prosody | $\leftrightarrow$ | information structure |

## Further examples of prosodic approaches

- **Szendrői (2001, 2003) for Hungarian**
  Rule 1: Put sentence stress on the focus.
  Rule 2: Put sentence stress on the leftmost element.
  $\rightarrow$ Foci move to the left periphery.
- **Neeleman and Reinhart (1998) for Dutch:**
  Rule 1: Do not put sentence stress on given elements.
  Rule 2: Put sentence stress on the rightmost element.
  $\rightarrow$ Given elements are scrambled away from the rightmost position.

# Prosodic approach: conflicting rules in Czech

## Given elements are deaccented in Czech

"Constituents which are **known, repeated, self-evident, or functional**, are typically **unaccented**, whereas constituents which are important, new (i.e. not repeated) have accent, in which they can be told apart from known constituents." (Petřík 1938:132–33)

## Sentence stress is rightward-oriented in Czech

On the level of the phonological phrase and the intonational phrase, **stress** is assigned to the **right** (see Daneš 1957:63):

```
(                                                 *    )   IP
(            *  )  (                               *    )   pP
Naštvaní  učitelé  stávkovali  před  budovou  parlamentu.
```

→ Is scrambling a result of this conflict?

# General predictions

## Partition approach

The presence of a **given-new-partition** is the crucial requirement for acceptability: an utterance should not be acceptable unless all given elements appear to the left of all new elements.

## Prosodic approach

**Deaccentuation of given elements** is the crucial requirement for acceptability: an utterance should not be acceptable if main stress falls on a given element.

# Specific predictions that we tested experimentally

### Experiment 1

Determining the baseline: What happens in an **all-new context**?

### Experiment 2

Which positions are acceptable for a **given object**?

**Partition approach:** Only positions preceding all new elements.
**Prosodic approach:** Any position except the rightmost one with sentence stress.

### Experiment 3

Is **stress-shift** an alternative to scrambling?

**Partition approach:** No, given elements must scramble above new ones.
**Prosodic approach:** Yes, this should be an alternative way of avoiding stress on a given element.

# Experiment 1: What happens in an all-new context?

## Scrambling the object in an all-new context

(2)   (C)   Dávali něco zajímavého ve zprávách?
             *'Was there anything interesting in the news?'*

      (a)   Dnes prý ředitele ING-banky maskovaní muži unesli na neznámé <u>místo</u>.
           *'Today some masked men have allegedly kidnapped the ING-bank director to an unknown place.'*
      (b)   Dnes prý maskovaní muži ředitele ING-banky unesli na neznámé <u>místo</u>.
      (c)   Dnes prý maskovaní muži unesli ředitele ING-banky na neznámé <u>místo</u>.
      (d)   Dnes prý maskovaní muži unesli na neznámé místo ředitele <u>ING-banky</u>.

## All-new context (schematically)

(C)  All-new
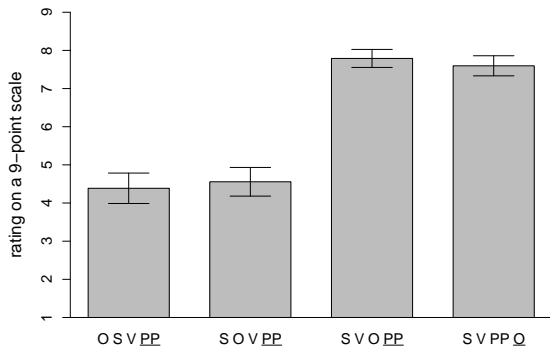
(a)  O S V <u>PP</u>
(b)  S O V <u>PP</u>
(c)  S V O <u>PP</u>
(d)  S V PP <u>O</u>

# Experiment 1: What happens in an all-new context?



$\rightarrow$ Both S V O <u>PP</u> and S V PP <u>O</u> are possible orders in a context where no givenness-related movement is assumed to happen.

# Experiment 2: Where can a given object scramble to?

## Scrambling of a given object (new subject)

(3)    (C)   Zjistil jsi, proč dnes sekretářka tak nadávala?
*'Did you find out why our secretary was so angry today?'*

        (a)   Protože prý **sekretářku** Karel poslal <u>do obchodu</u>.
*'Because Karel allegedly sent the secretary to the store.'*

        (b)   Protože prý Karel **sekretářku** poslal <u>do obchodu</u>.
        (c)   Protože prý Karel poslal **sekretářku** <u>do obchodu</u>.
        (d)   Protože prý Karel poslal do obchodu <u>**sekretářku**</u>.

# Experiment 2: Where can a given object scramble to?

## Scrambling of a given object (given subject)

(4)    (C)    Zjistil jsi, proč dnes sekretářka nadávala na Karla?
            *'Did you find out why our secretary was so angry with Karel today?'*

    (a)    Protože prý **sekretářku Karel** poslal <u>do obchodu</u>.
            *'Because Karel allegedly sent the secretary to the store.'*
    (b)    Protože prý **Karel sekretářku** poslal <u>do obchodu</u>.
    (c)    Protože prý **Karel** poslal **sekretářku** <u>do obchodu</u>.
    (d)    Protože prý **Karel** poslal do obchodu <u>**sekretářku**</u>.

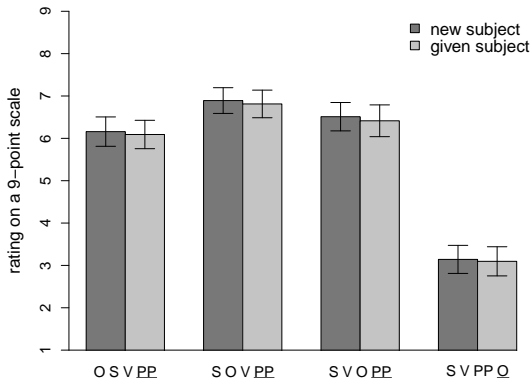# Experiment 2: Where can a given object scramble to?

| Predictions for given object, new subject: | | |
|---|:---:|:---:|
| | partition approach | prosodic approach |
| (a) **O** S V <u>PP</u> | ✓ | ✓ |
| (b) S **O** V <u>PP</u> | ✗ | ✓ |
| (c) S V **O** <u>PP</u> | ✗ | ✓ |
| (d) S V PP **<u>O</u>** | ✗ | ✗ |

| Predictions for given object, given subject: | | |
|---|:---:|:---:|
| | partition approach | prosodic approach |
| (a) **O S** V <u>PP</u> | ✓ | ✓ |
| (b) **S O** V <u>PP</u> | ✓ | ✓ |
| (c) **S** V **O** <u>PP</u> | ✗ | ✓ |
| (d) **S** V PP **<u>O</u>** | ✗ | ✗ |

# Experiment 2: Where can a given object scramble to?



$\rightarrow$ Predictions of the prosodic approach are borne out: all conditions without sentence stress on the given object are acceptable, and the givenness status of the subject does not have any influence.

# Experiment 3: Is stress shift an option?
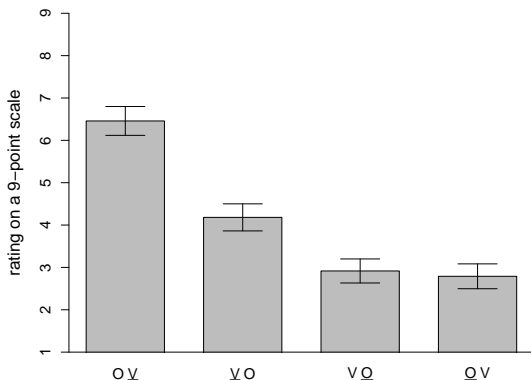
## Scrambling vs. stress shift

(5)  (C)   Nevím, jak dlouho to ještě budeme snášet. Musíme se toho potkana ve sklepě co nejdřív zbavit.
*'I don't know how long we will tolerate this. We have to get rid of that rat in the cellar.'*

(a)   No, volal mi Jirka, že prý právě **potkana** <u>objevil</u>.
*'Well, Jirka called that he has just found the rat.'*

(b)   No, volal mi Jirka, že prý právě <u>objevil</u> **potkana**.

(c)   No, volal mi Jirka, že prý právě <u>objevil</u> **potkana**.

(d)   No, volal mi Jirka, že prý právě **<u>potkana</u>** objevil.

# Experiment 3: Is stress shift an option?

| Predictions for given object, new verb: | | partition approach | prosodic approach |
|---|---|:---:|:---:|
| (a) | scrambling: **O** <u>V</u> | ✓ | ✓ |
| (b) | stress shift: <u>V</u> **O** | ✗ | ✓ |
| (c) | nothing: V <u>**O**</u> | ✗ | ✗ |
| (d) | both: <u>**O**</u> V | ✓? | ✗ |

# Experiment 3: Is stress shift an option?



$\rightarrow$ Intermediate acceptability for utterances with shifted sentence stress: it is better than the clearly ungrammatical options, but not as acceptable as the scrambled variant.

# Implementation: OT constraints

We propose to model the observations within the OT-framework, adopting the following constraints:

## Destress-Given

A given phrase is prosodically nonprominent (Féry & Samek-Lodovici 2005), more precisely for Czech: it does not receive the strongest stress in the intonation phrase.
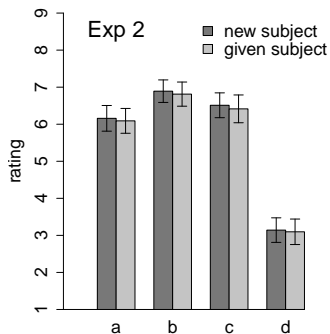
## NSR-I

The strongest stress in the intonation phrase falls on the rightmost phrasal stress (Truckenbrodt 2012).

Ranking: Destress-Given >> NSR-I
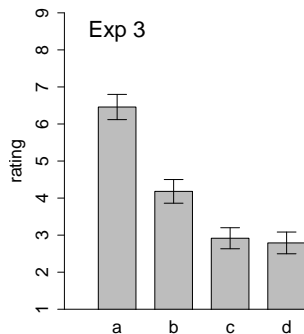
# Implementation: OT analysis

| | | D-G | NSR-I |
|---|---|---|---|
| | S V PP **O** | *! | |
| ☞ | S V **O** <u>PP</u> | | |
| ☞ | S **O** V <u>PP</u> | | |
| ☞ | **O** S V <u>PP</u> | | |

new S, new V, new PP, given O

# Implementation: OT analysis

**new V, given O**

| | | D-G | NSR-I |
|---|---|---|---|
| ☞ | scrambling: **O** <u>V</u> | | |
| | stress shift: <u>V</u> **O** | | *! |
| | nothing: V **<u>O</u>** | *! | |
| | both: **<u>O</u>** V | *! | * |



Exp 3

rating

### Issue: Graded acceptability

The standard OT framework is designed to determine **the optimal one among a set of candidates**. In its basic form, it does not provide a ranking of the other candidates for modeling **intermediate acceptability**.

## Potential solution 1: restricting the reference set

If the **reference set is restricted** to VO word order, stress shift is the optimal candidate, but excluding scrambled orders from the reference set is suboptimal in itself.

|  |  | D-G | NSR-I |
|---|---|---|---|
| ☞ | stress shift: <u>V</u> **O** |  | * |
|  | nothing: V <u>**O**</u> | *! | * |

# Implementation: issues
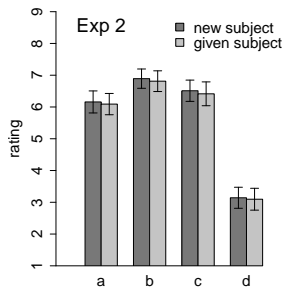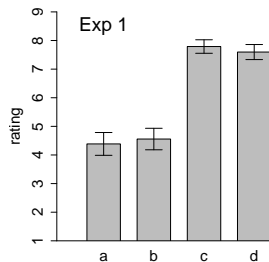
## Potential solution 2: weighted constraints

In Linear Optimality Theory (Keller 2000), constraints are associated with **weights**, and **violations are cumulativ**e. More fine-grained acceptability predictions emerge.

|  | D-G w = 4 | NSR-I w = 2 | score |
|---|---|---|---|
| scrambling: **O** <u>V</u> |  |  | 0 |
| stress shift: <u>V</u> **O** |  | * | -2 |
| nothing: V **<u>O</u>** | * |  | -4 |
| both: **<u>O</u>** V | * | * | -6 |

# Implementation: issues

## Economy?

It is a common and often crucial assumption that optional syntactic operations should **only** be allowed if it is necessary for fulfilling an **interface requirement**. If that's the explanation for the contrasts in exp 1, a contradiction with exp 2 arises.

# Conclusion

- **Givenness** influences **word order** in Czech $\rightarrow$ confirmed.
- Experiment 2 showed that all tested word orders in which no given elements bears sentence stress were acceptable, as predicted by the prosodic approach. A **given-new-partition is not necessary**, so the partition approach undergenerates.
- Experiment 3 showed that shifting the sentence stress away from a given element in rightmost position raises acceptability significantly, but it is not as good as scrambling.
- We have proposed an **OT analysis** to model the observations.
- This solution does not involve a direct interaction between word order and information structure. A connection is established **indirectly** via prosody.