

Definiteness and articleless languages

Radek Šimík
University of Potsdam/SFB632
simik@uni-potsdam.de

Letní škola lingvistiky, Dačice
August 17-22, 2014

Handout from 22nd August 2014 [final version]

1 Introduction

Plan

- Basic uses of definite DPs in languages with articles. How are comparable functions expressed in languages without articles?
- Semantics of definite DPs in languages with articles. How is comparable semantics achieved in languages without articles?
- Semantics of bare NPs in languages with and without articles.
- Definiteness and information structure.

Languages with articles

Articles are obligatory with singular count nouns.

- (1) a. I didn't sleep long, **the dog** woke me up.
b. I didn't sleep long, **a dog** woke me up.
c. *I didn't sleep long, **dog** woke me up. English
- (2) a. Ich habe nicht lange geschlafen, **der Hund** hat mich geweckt.
b. Ich habe nicht lange geschlafen, **ein Hund** hat mich geweckt.
c. *Ich habe nicht lange geschlafen, **Hund** hat mich geweckt. German

Languages without articles

Singular count nouns can be bare.

- (3) a. Nespal jsem dlouho, vzbudil mě **ten pes**.
b. Nespal jsem dlouho, vzbudil mě **nějaký pes**.
c. Nespal jsem dlouho, vzbudil mě **pes**.

(Terms to explain: definite DP/description, indefinite DP, bare NP, reference, existential quantification, presupposition)

A little bit of typology

620	languages	examined in total
308	languages	have specialized definite articles (or affixes)
69	languages	use demonstratives as definite articles
243	languages	have no definite articles

Table 1: Definiteness marking (Dryer 2013a)

534	languages	examined in total
126	languages	have specialized indefinite articles (or affixes)
112	languages	use numeral ‘one’ as the indefinite article
296	languages	have no indefinite articles

Table 2: Indefiniteness marking (Dryer 2013b)

2 Types of definites

2.1 Core types: anaphoric and situational

There are two most typical uses of the definite article (see, e.g., Hawkins 1978; Schwarz 2009): (a) **anaphoric**, where the definite DP refers to a referent introduced in the preceding discourse, and (b) **situational**, where the definite DP refers to a referent that is the only one that satisfies the description in a certain situation.

- (4) a. Context: I met **a likeable school director** at the educational congress.
The director invited me for a coffee.
- b. Situation: *I’m a teacher at a school, talking to a colleague of mine.*
The director invited me for a coffee.
- (5) a. Context: The newly discovered planet has **an interesting moon**.
The moon might harbor primitive life.
- b. Situation: *Here on Earth, an optimist speaking...*
The moon might harbor primitive life.

In Czech, there is strong tendency to use the demonstrative in the anaphoric function and nothing in the situational function.

- (6) a. Context: Na tom kongresu o vzdělání jsem potkal (jednu) sympatickou ředitelku školy.
Ta ředitelka / # **ředitelka** mě pozvala na kafe.
- b. Situation: *Jsem učitelem na škole a bavím se se svým kolegou.*
Ředitelka / # **Ta ředitelka** mě pozvala na kafe.
- (7) a. Context: Ta nově objevená planeta má zajímavý měsíc.
Na **tom měsíci** / # **měsíci** by mohl být primitivní život.
- b. Situation: *Tady na zemi, mluví optimista...*
Na **měsíci** / # **tom měsíci** by mohl být primitivní život.

2.2 Further types

This is a non-exhaustive list of the uses of definite DPs in languages with articles.

Deixis/ostension

Some definite DPs, i.e., DPs with the definite article (not a demonstrative), may be used for external reference (ostension). While this is impossible in English, it is possible in German (though only using “strong articles”; Schwarz 2009.)

- (8) #I’ll be searching in **the house** and you’ll be searching in **the house**.
- (9) Ich suche in **dem₁ Haus** und du suchst in **dem₂ Haus**. [cf. # im Haus]
 I search in the house and you search in the house
 ‘I’ll be searching in that house and you’ll be searching in that house.’

It is not surprising that demonstratives can be used in Czech demonstratively:

- (10) Já budu hledat v tom₁ domě a ty hledej v tom₂ domě. [cf. # v domě]

Bridging

Bridging (Clark 1975) is also called *associative anaphora* (Hawkins 1978) or *inferrable definites* (Prince 1981).

Schwarz (2009) argues that there are two kinds of bridging. In one case, e.g. (11), the definite DP is in some salient relation to an explicit antecedent: ‘the author of the book’ in (11a) and ‘the side-view mirrors of his car’. In other cases, e.g. (12), there is no explicit antecedent. The linguistic context only introduces a situation, which (by means of world knowledge) supplies a single referent for the definite DP: ‘the steering wheel of the car Mary was driving’ in (11) and ‘the railway station of the town Sue arrived in’.

- (11) a. Context: John bought a book yesterday.
The author was French.
- b. Context: Dave washed his car, ...
 but forgot to wash **the side-view mirrors**.
- (12) a. Context: Mary was driving down the street.
The steering wheel was cold.
- b. Sue arrived at half past five.
The railway station was shabby.

Marble sentences (Heim 1982; attributed to Barbara Partee):

- (13) Context: There were 10 marbles in the bag, but I only found 9 of them.
The missing marble must be under the couch.

Note that if the situation does not supply a single referent, the use of a definite DP is infelicitous.

- (14) Context: Mary was driving down the street.
 #**The wheel** / A wheel / One (of the) wheel(s) was making a strange noise.

In Czech, bridging seems to be expressed primarily with bare NPs.

- (15) a. Context: Honza si včera koupil knihu.
Autorem / # tím autorem je Francouz.
- b. Context: David si umyl auto, ...
 ale zapomněl na **zpětná zrcátka / # ta zpětná zrcátka**.
- (16) a. Context: Marie řídila.
Volant / # Ten volant byl studený.
- b. Context: Zuzka přijela v půl šesté.
Nádraží / # To nádraží bylo špinavé a neudržované.
- (17) Context: V pytlíku bylo deset kuliček a našel jsem jenom devět.
Chybějící kulička / Ta chybějící kulička určitě bude pod sedačkou.

The condition of there being a single referent also seems to hold for Czech:

- (18) Context: Marie řídila.
 # **Kolo** / Jedno kolo vydávalo podivný zvuk.

Epithets

See e.g. Aoun and Choueiri (2000); Corazza (2005).

Epithets are typically as anaphors:

- (19) Context: Did you hear what Paul did?
 I never want to see **the traitor** again.
- (20) Context: I don't know how to help grandpa anymore.
The old fool bought an overpriced lawn mower last week.

They could be used without antecedents, too:

- (21) Situation: *Our neighbor's dog is barking.* **The damn animal** woke me up again.

In Czech, epithets seem to require demonstratives.

- (22) Context: Slyšel jsi, co udělal Pavel?
 Už nechci **toho zrádce** / # **zrádce** ani vidět.
- (23) Context: Už nevím, jak mám dědovi pomoci.
Ten starý ňouma / # **Starý ňouma** si minulý týden koupil předraženou sekačku na trávu.
- (24) Situation: *Pes našeho souseda štěká.*
To zatracené zvíře / # **Zatracené zvíře** mě zase probudilo.

Kind terms

Kind terms are NPs/DPs that refer to a whole class of individuals or a concept (*generic reference*) rather than just a single individual (Carlson 1977; Carlson and Pelletier 1995; Chierchia 1998; Dayal 2004).

- (25) a. **The tiger** is rare.
 b. **The dodo** is extinct.
 c. **The Kodiak bear** is the largest brown bear.
 d. Jakub Kryštof Rad invented **the sugar cube**.

Note further the following paradigm, which suggests a differential behavior of singular and plural kind terms (see, e.g., Dayal 1992, 2004).

- (26) a. ***Bird** evolved from dinosaur.
 b. **The bird** evolved from the dinosaur.
- (27) a. **Birds** evolved from dinosaurs.
 b. #**The birds** evolved from the dinosaurs.

Compare this to Romance, here represented by Italian (data from Dayal 2004:438), which uses the definite article with kind terms, irrespective of number marking.

- (28) a. ***Cane** é diffuso.
 dog is widespread
 b. **Il cane** é diffuso.
 the dog is widespread
 ‘The dog is widespread.’
- (29) a. ***Cani** sono diffusi.
 dogs are widespread
 b. **I cani** sono diffusi.
 the dogs are widespread
 ‘Dogs are widespread.’

Kind reference appears to be expressed by bare NPs in Czech, irrespective of number marking.

- (30) a. **Tygr** / # **Ten tygr** je vzácný.
 b. **Dodo** / # **Ten dodo** vymřel.
 c. **Medvěd Kodiak** / # **Ten medvěd Kodiak** je největší hnědý medvěd.
 d. Jakub Kryštof Rad vynalezl **kostku cukru** / # **tu kostku cukru**.
- (31) a. **Pták** / # **Ten pták** se vyvinul z dinosaura.
 b. **Ptáci** / # **Ti ptáci** se vyvinuli z dinosaurů.

Weak definites

Weak definites are definite DPs that do not seem to refer in the usual way, if they refer at all (Carlson et al. 2006; Aguilar-Guevara 2014). Notice that there is no requirement for there to be a single referent for the definite DP.

- (32) a. I was listening to **the radio**.
 b. After the accident in New York, Mary was taken to **the hospital**.
 c. Please take **the elevator** to the second floor.

Weak definites always seem to correspond to bare NPs in Czech.

- (33) Poslouchal jsem **rádio** / # **to rádio**.
 (33) Po nehodě v New Yorku byla Marie převezena do **nemocnice** / # **té nemocnice**.
 (33) Vyjeďte prosím **výtahem** / # **tím výtahem** do druhého patra.

Covaryng definites

Some the reference of definite DPs is dependent on a quantifier. Strictly speaking, such definite DPs are not referential at all, they behave more like bound variables.

Covarying uses of anaphoric definite DPs:

- (34) Every child that found **a mushroom** showed **the mushroom** to the teacher.
 ‘Paul found a mushroom x and showed x to the teacher, Lisa found a mushroom y and showed y to the teacher, etc.’
- (35) No child that found **a mushroom** showed **the mushroom** to the teacher.
 ‘Paul found a mushroom x and didn’t show x to the teacher, Lisa found a mushroom y and didn’t show y to the teacher, etc.’

Covarying uses of situational definite DPs:

- (36) At every railway station I received a letter from **the mayor**.

Covarying uses in Czech are possible with both demonstrative NPs and bare NPs, depending on whether these are anaphoric or situational.

- (37) Každé dítě, co našlo houbo, ukázalo **tu houbo** / ?**houbo** učíteli.
- (38) Na každé železniční stanici jsem obdržel dopis od **starosty** / # **toho starosty**.

2.3 Summary

Table 3 shows how the different functions of definiteness is realized across a small number of languages.

Legend: dem: demonstrative, art: article, s-art: strong article, w-art: weak article, \emptyset : no determiner, empty space: no systematic information available to me at the moment.

	Deixis	Epithet	Anaphor	Situational	Kind	Source
Romance				art	art	Dayal (2004)
German	s-art/dem	s-art/dem	s-art/dem	w-art	w-art/ \emptyset	Schwarz (2009); Dayal (2004)
English	dem	art/dem	art/dem	art	\emptyset	Dayal (2004)
Czech	dem	dem	dem/? \emptyset	\emptyset	\emptyset	
Hindi			\emptyset	\emptyset	\emptyset	Dayal (2004)

Table 3: Definiteness functions and forms

3 Semantics of definite DPs

The structure of DPs: articles and other determiners are of a special D(eterminer) category and are the head of the whole nominal phrase (Brame 1982; Abney 1987).

- (39)
-
- ```

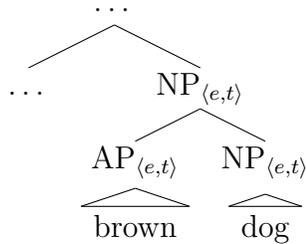
graph TD
 DP --> D
 DP --> NP1[NP]
 D --- D_text["the/a/every/..."]
 NP1 --> AP
 NP1 --> NP2[NP]
 AP --- AP_text["brown"]
 NP2 --- NP2_text["dog"]

```

### Preliminaries: NPs

Standard assumption: NPs are predicates and denote sets of individuals / functions from individuals to truth-values (but see Baker 2003, who argues that NPs primarily denote individuals).

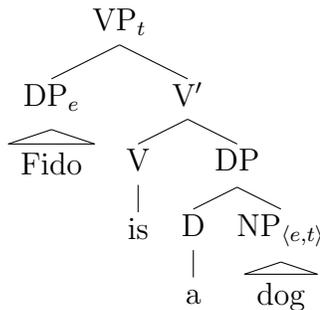
(40)



- (41) a.  $\llbracket [\text{NP dog}]_{\langle e,t} \rrbracket = \lambda x.x \text{ is a dog}$   
 b.  $\llbracket [\text{AP dog}]_{\langle e,t} \rrbracket = \lambda x.x \text{ is brown}$   
 c.  $\llbracket [\text{NP} [\text{AP brown}]_{\langle e,t} [\text{NP dog}]_{\langle e,t} ]_{\langle e,t} \rrbracket = \lambda x.x \text{ is brown and } x \text{ is a dog}$

This semantics can be directly used when NPs are used as predicates (ignoring the semantic contribution of the indefinite article and the copula). Thus, (42) is true iff Fido belongs to the set of dogs.

(42)

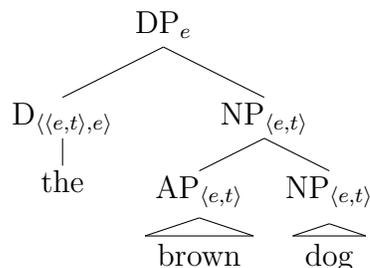


- (43)  $\llbracket [\text{VP Fido is a dog}]_t \rrbracket = 1$  iff  
 a.  $\llbracket [\text{dog}]_{\langle e,t} \rrbracket (\llbracket [\text{Fido}]_e \rrbracket) = 1$  iff  
 b.  $\llbracket [\lambda x.x \text{ is a dog}] \rrbracket (\text{Fido}) = 1$  iff  
 c.  $\text{Fido is a dog} = 1$

### 3.1 Denotation of definite DPs

Most widely adopted assumption: The definite article *the* denotes a function from predicates to individuals (Frege 1879; Elbourne 2005, 2013; Heim 2011). As a result, the whole definite DP denotes an individual, or we could say, it refers to an individual.

(44)

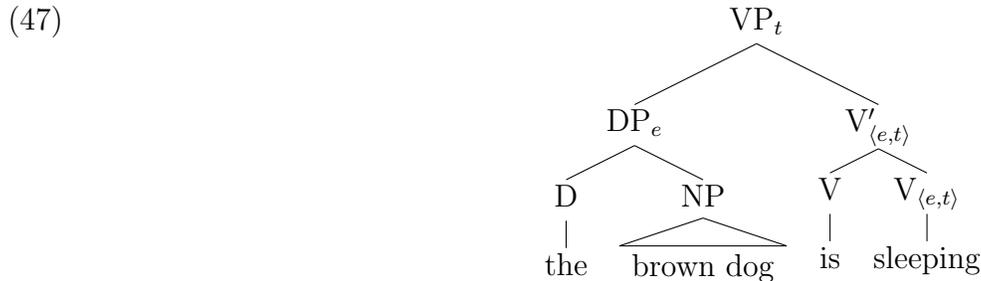


- (45)  $\llbracket [\text{the}]_{\langle\langle e,t \rangle, e \rangle} \rrbracket = \lambda P.\iota x.P(x)$ , where  $\iota x.P(x)$  is “the individual  $x$  that is  $P$ ”

- (46)  $\llbracket [\text{the}]_{\langle\langle e,t \rangle, e \rangle} [\text{NP brown dog}]_{\langle e,t} \rrbracket =$   
 a.  $\llbracket [\text{the}]_{\langle\langle e,t \rangle, e \rangle} \rrbracket (\llbracket [\text{NP brown dog}]_{\langle e,t} \rrbracket) =$   
 b.  $\llbracket [\lambda P.\iota x.P(x)] \rrbracket (\lambda y.y \text{ is brown and } y \text{ is a dog}) =$

- c.  $\iota x. [\lambda y. y \text{ is brown and } y \text{ is a dog}](x) =$
- d.  $\iota x. x \text{ is brown and } x \text{ is a dog} =$
- e. the individual  $x$  that is brown and that is a dog

This semantics can be directly used when definite DPs are used as arguments (subjects, objects). Thus, (47) is true iff the individual  $x$  that is brown and that is a dog is sleeping. Again, we're ignoring the semantics of the copula.



- (48)  $\llbracket \text{The brown dog is sleeping} \rrbracket = 1$  iff
- a.  $\llbracket \text{sleeping}_{(e,t)} \rrbracket (\llbracket \text{DP the brown dog} \rrbracket_e) = 1$  iff
  - b.  $\llbracket \lambda y. y \text{ is sleeping} \rrbracket (\iota x. x \text{ is brown and } x \text{ is a dog}) = 1$  iff
  - c.  $\llbracket \iota x. x \text{ is brown and } x \text{ is a dog} \rrbracket \text{ is sleeping} = 1$  iff
  - d. The individual  $x$  that is brown and a dog is sleeping.

There are also predicative and perhaps even quantificational uses (judging by the coordination test) of definite DPs.

- (49)
- a. John is tall, handsome, and **the love of my life**.
  - b. Every cat and **the brown dog** were sleeping.

## 3.2 Presuppositions of definite DPs

### Existential presupposition

Definite DPs presuppose the existence of individuals in the extension of the NP they contain.

- (50)
- a. the brown dog: presupposes that there is a brown dog in the situation
  - b. (a) brown dog: no such presupposition

Cases where the presupposition fails:

- (51)
- a. We didn't visit the Classisist chateau in Dačice.
  - b. #We didn't visit the Romanesque rotunda in Dačice.
  - c. We didn't visit a Romanesque rotunda in Dačice (because there is none).

Local accommodation:

- (52) If there is a Romanesque rotunda in Dačice, we will definitely visit **it/the rotunda**.

Global accommodation:

- (53) **The brother of my mom** likes diving.

## Uniqueness presupposition

Definite DPs presuppose the existence of exactly one entity in the extension of the NP they contain. Note: This presupposition entails the existential presupposition.

(54) the brown dog: presupposes that there is *exactly one* brown dog in the situation

Cases where the presupposition fails include (51b), but also the following:

- (55) a. #**The town in Sweden** was severely flooded last week.  
 b. A town in Sweden was severely flooded last week.

Accommodation:

(56) Situation: *In a big clothes store*  
 I was looking for socks. **The shop assistant** told me that she'd ask a colleague of hers.

## Plurals and maximal individuals

Plural definite DPs seem to violate the uniqueness presupposition routinely:

(57) The students in this class passed the test.

Standard analysis: Individuals in the model can also be *groups*. *Atomic* individuals combine into more complex ones, these combine into yet more complex ones, creating a structure called semi-lattice (Link 1983). The elements of such a semilattice are then partially ordered by the part-of relation (e.g., a is part of a+b, a+c, and a+b+c). This is illustrated in Table 4.

|     |       |     |   |                                   |
|-----|-------|-----|---|-----------------------------------|
|     | a+b+c |     | ← | <i>group (maximal individual)</i> |
| a+b | a+c   | b+c | ← | <i>groups</i>                     |
| a   | b     | c   | ← | <i>atoms</i>                      |

Table 4: Representation of plural individuals à la Link (1983)

In domains with plural individuals, the definite article picks out the *maximal individual* in the domain. For instance, our example (57) will be false if there are some students in this class that didn't pass the test.

The uniqueness presupposition in singulars is then reformulated as the maximality presupposition (where uniqueness falls out as a special subcase with just a single maximal individual that

## Formal implementation of the presupposition(s)

The existential/uniqueness/maximality presupposition is normally considered a lexical property of the definite article (and some other determiners). Formally, the definite article denotes a *partial* function, applying only to predicates, whose extension contains a maximal individual, returning that individual as its value. The presupposition is introduced by  $\underline{\text{ : and is underlined, for clarity.}}$

(58)  $\llbracket \underline{\text{the}}_{\langle e, t, e \rangle} \rrbracket = \lambda P : \exists x.P(x) \wedge \forall y[P(y) \rightarrow x \geq y].\iota x.P(x)$

### 3.3 Applying the denotation to the basic types of definites

The denotation proposed above (or a variant thereof) is well-suited for situational uses, but other might require more work; yet, see Elbourne (2005, 2013) for a unified analysis of all types of definites, which takes the situational use as the primary one.

#### Situational definites

The denotation of definite DPs, i.e., their referent, can only be identified with respect to a certain situation.

- (59)
- a.  $\llbracket \text{The projector is running} \rrbracket = 1$  iff  
the individual  $x$  that is a projector (the only projector) in situation  $s$  is running in  $s$
  - b.  $\llbracket \text{The Moon is the only Earth's natural satellite} \rrbracket = 1$  iff  
the individual  $x$  that is a moon (the only moon) in our world  $w$  and that moon is the only Earth's natural satellite
  - c.  $\llbracket \text{The chairs in this classroom were bought in IKEA} \rrbracket = 1$  iff  
the individual  $x$  that is a group of chairs (the maximal group of chairs) in situation  $s$  are such that there is a situation  $s'$  some time in the past and  $x$  were bought in IKEA

**Covarying uses:** Remember, definite DPs in covarying uses are not referential. Also, they seem to present a problem for the idea that singular definite DPs come with a uniqueness presupposition.

- (60) Every time I stopped at a railway station, I spoke to the mayor. (= I spoke to more than just one mayor)

**Solution:** Uniqueness of *the mayor* is satisfied: there is indeed only one mayor, provided we look at the situations of stopping at railway stations individually.

- (61) Every situation  $s$  with some railway station  $x$  where I stopped is such that I spoke to the individual  $y$  that is a mayor (the only mayor) in some proper supersituation  $s'$  (involving a town) of  $s$  (involving the railway station  $x$ ).

#### Anaphoric definites

Schwarz (2009): There are languages (like German, and arguably also Czech) use different forms for situational uses and anaphoric uses.

- (62) Context: Hans interviewed a writer and a politician.

Er hat # **vom** / **von dem Politiker** keine interessanten Antworten bekommen.  
 he has from.w-art / from s-art politician no interesting answers received  
 'He got no interesting answers from the politician.'

- (63) Der Empfang wurde **vom** /# **von dem Bürgermeister** eröffnet.  
 the reception was by.w-art by s-art mayor opened  
 'The reception was opened by the mayor.'

**Schwarz's idea:** Anaphoric definites are essentially situational definites plus an explicitly expressed relation with an antecedent.

A simple anaphoric-only semantics (à la Heim 1982; Kamp and Reyle 1993):

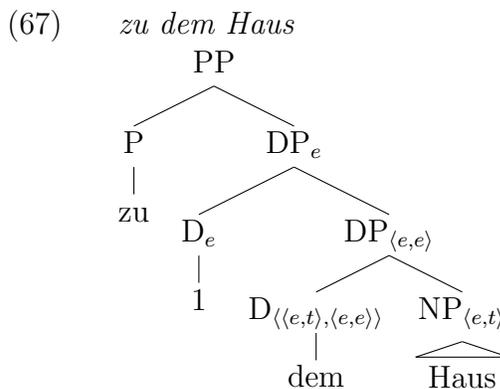
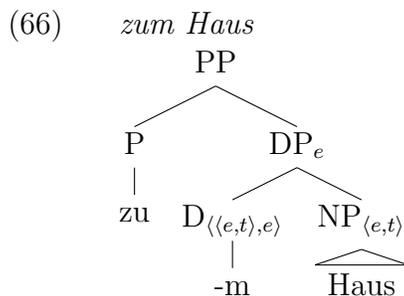
(64)  $\llbracket [\text{DP the dog}_1]_e \rrbracket^g = \llbracket [\text{DP a dog}_1]_e \rrbracket^g = g(1).g(1)$  is a dog

**Familiarity vs. novelty:** The difference between definite and indefinite DPs is pragmatic/discourse-related, not semantic: The referent of *the dog* must be *familiar*: already present in the set of introduced discourse referents. The referent of *a dog* must be *novel*: just being introduced as a discourse referent.

**Schwarz's formal implementation:** Anaphoric definite DPs use the strong definite article, which has an additional argument: the discourse referent that the denotation of the definite DP is equivalent to (I'm leaving out the uniqueness presupposition for simplicity, though Schwarz assumes that it is there).

- (65) a. Weak article (for situational uses):  
 $\llbracket \text{the}_{\langle (e,t),e \rangle} \rrbracket = \lambda P.\iota x.P(x)$   
 b. Strong article (for anaphoric uses):  
 $\llbracket \text{the}_{\langle (e,t),\langle e,e \rangle} \rrbracket = \lambda P.\lambda y.\iota x.P(x) \wedge x = y$ , where  $y$  is familiar in the sense of Heim (1982)

Structural consequences:



Consequences for Czech:

- The weak article does not exist (its semantics is encoded in a non-lexical way).
- The strong article is, at least sometimes, lexicalized by the demonstrative.

Two conflicting pragmatic pressures, resulting in a tension between the use of strong and weak articles in German (or demonstratives and nothing in Czech).

1. Economy of expression: Express the intended meaning in the most parsimonious way possible.
2. The Panini principle/The elsewhere condition: Express the intended meaning in the most specific way.

### 3.4 A note on demonstratives

Elbourne (2008) argues that demonstratives are essentially definite DPs:

- They introduce the existential and uniqueness presuppositions.
- They have anaphoric uses.
- They have covarying uses.

## Special properties

Ostension: Demonstrative DPs often rely on ostension/extralinguistic deixis for their reference, see e.g. (68a). There are interesting cases of “deferred ostension”.

- (68) a. that dog [pointing at a dog]  
 b. That parrot [pointing at an empty cage] is just outside of its cage, but this parrot [pointing at another empty cage] had to go to the vet.

Elbourne’s analysis: Demonstrative DPs have two additional arguments on top of ordinary definite DPs: an index (an individual variable, similar to Schwarz’s additional argument of strong articles), and a relational variable that determines the relation between the index (what is being pointed at) and the referent of the DP. The denotation below is a simplification (again, presuppositions are left out for simplicity).

$$(69) \quad \llbracket \text{this} \rrbracket = \lambda P. \lambda x. \lambda R. \iota y. P(y) \wedge R(x, y)$$

$$(70) \quad \llbracket \text{this parrot [pointing at a cage]} \rrbracket = \iota y. y \text{ is a parrot and } y \text{ lives in the cage that I'm pointing at}$$

Proximity/distality

- (71) a. ten pes  
 b. tento/tenhle(ten) pes / this dog  
 c. tamten/tamhleten pes / that dog

## 4 Semantics of bare NPs (plurals)

Bare NPs can be both definite and indefinite:

- (72) a. **Ředitel** nařídil, abychom přišli na osm.  
 director said comp.1pl come at eight  
 ‘The director told us to come at eight.’  
 b. Včera jsem si koupil **zajímavou knížku**.  
 yesterday aux.1sg refl bought interesting book  
 ‘Yesterday I bought an interesting book.’

In addition, we saw that they can denote/refer to kinds:

- (73) Pták je obratlovec s křídly.  
 bird is vertebrate with wings  
 ‘The bird is a vertebrate with wings.’

### Questions:

- Is this a case of ambiguity or underspecification? Or are bare NPs actually always definite? Or always indefinite?
- Which factors influence the choice between the definite and indefinite readings? World knowledge, lexical properties, grammatical properties (subject/object), prosodic properties (stress), information structure (givenness, topicality, focus)...?

## 4.1 Bare NPs are always indefinite (suggested by Heim 2011)

Semantics of definite vs. indefinite DPs:

- (74) a.  $\llbracket \text{the director} \rrbracket = \iota x.x \text{ is a director}$   
 b.  $\llbracket \text{a director} \rrbracket = \lambda P.\exists x.x \text{ is a director and } x \text{ is } P$

Heim (2011): There is an entailment relation between sentences containing definites and indefinites. In particular, sentences with definites entail those with indefinites: whenever (75a) is true, (75b) is true as well, but not the other way around. In other words, (75a) is semantically stronger than (75b).

- (75) a.  $\llbracket \text{The director joined our discussion} \rrbracket$   
 $= \llbracket \iota x.x \text{ is a director} \rrbracket \text{ joined our discussion}$   
 b.  $\llbracket \text{A director joined our discussion} \rrbracket$   
 $= \exists x.x \text{ is a director and } x \text{ joined our discussion}$

### Horn scales and implicatures

Heim's idea (see also Heim 1991): *the* and *a* in English are on a so called *Horn scale*.

- (76) a. *Horn scale for articles*  
 the > a  
 b. *Horn scale for numerals*  
 5 > 4 > 3 > 2  
 c. *Horn scale for quantifiers*  
 always > sometimes, all/every > some

These scales generate *conversational implicatures*: Say we have (75b). The reasoning of the hearer of this sentence:

- The speaker chooses to say *a director* rather than *the director*.
- Assuming that he follows Grice's maxim of quantity (be as informative as possible, to the extent that you're truthful), the sentence with *a director* must be the strongest statement he can say.
- Knowing this, the hearer infers that the the stronger statement involving *the director* is false (or that its presupposition is not satisfied), otherwise the speaker would say it.

We get the following strengthened interpretation for (75b):

- (77)  $\exists x.x \text{ is a director and } x \text{ joined our discussion} \ \& \ \neg[\iota x.x \text{ is a director}] \text{ joined our discussion}$   
 'Some director but not our director joined our discussion.'

### Consequences for articleless languages

There is no Horn scale for articles (the > a) in Czech because there are no articles. Hence, there is no conversational implicature triggered and the definite reading is not negated. As a result, NPs interpreted as indefinites are compatible with the definite interpretation, too. It is merely a question of pragmatics and context whether the indefinite interpretation will correspond to the interpretation of the English definite or indefinite DP.

- (78) Promluvil **organizátor**.  
 spoke organizer  
 'The/An organizer spoke.'

- (79)  $\exists x.x$  is an organizer and  $x$  spoke = 1 even if [ $\iota x.x$  is an organizer] spoke = 1

### Demonstratives

Under this analysis, demonstratives in their anaphoric function could be analyzed simply as markers of identity with previously introduced discourse referent.

- (80) Ten pes spí.  
dem dog sleeps  
'The/That dog is sleeping.'
- (81)  $\exists x.x$  is a dog and  $x$  is sleeping and  $x$  is equal to a previously introduced referent

## 4.2 Bare NPs are never indefinite (Dayal 2004)

Dayal (2004) proposes that bare NPs in languages without definite articles are never indefinite. They are always referential, they either refer to individuals or to kinds.

### Background on reference to kinds

Carlson (1977); Chierchia (1998): Bare plurals in English are (proper) names of kinds. In Chierchia's analysis, kinds correspond to maximal individuals. Even though they are the same semantic object as definite plurals, they are of a different *sort*.

- (82) *Type-shifting operators*
- $\iota$ : properties to objects (deriving definite DPs)
  - $\cap$ : properties to kinds (deriving kind-referring DPs)
  - $\exists$ : properties to existential quantifiers (deriving indefinite DPs)
- (83) *Semantic derivation of plural definites*
- $$\iota \left\{ \begin{array}{l} a + b + c, \\ a + b, \quad a + c, \quad b + c \end{array} \right\} = a + b + c$$
- such that  $a + b + c$  belongs to the set of **objects** (object-level entities)
- (84) *Semantic derivation of kinds*
- $$\cap \left\{ \begin{array}{l} a + b + c, \\ a + b, \quad a + c, \quad b + c \end{array} \right\} = a + b + c$$
- such that  $a + b + c$  belongs the set of **kinds** (kind-level entities)

Examples repeated from above:

- (85) a. **The bird** / \***Bird** evolved from dinosaur.  
b. **Birds** / \***The birds** evolved from dinosaurs. English
- (86) a. **Il cane** / \* **Cane** é diffuso.  
the dog dog is widespread  
b. **I cani** / \* **Cani** sono diffusi.  
the dogs dogs are widespread  
'Dogs are widespread.'
- (87) a. **Pták** / # **Ten pták** se vyvinul z dinosaura.  
b. **Ptáci** / # **Ti ptáci** se vyvinuli z dinosaurů.

- (88) Chierchia (1998); Dayal (2004)
- English lexicalizes  $\iota$  but not  $\cap$  by the definite article,  $\exists$  by the indefinite article<sup>1</sup>
  - Italian lexicalizes both  $\iota$  and  $\cap$  by the definite article,  $\exists$  by the indefinite article
  - Czech doesn't lexicalize  $\iota$ ,  $\cap$ , or  $\exists$  (it has no articles for situational definites, no articles for kinds, no articles for indefinites)
- (89) **Blocking principle** (Chierchia 1998): If you have a lexicalization for an operator, you must use it, rather than using its covert counterparts.
- (90) **Hierarchy of operators** (Dayal 2004):  $\{\cap, \iota\} > \exists$

- (91) a. Before type-shifting
- 
- b. After type-shifting
- 
- (92) a. Before type-shifting
- 
- b. After type-shifting
- 

### Deriving non-kind readings

Idea: Bare plurals are *always* kind-denoting, i.e., they are obligatorily input to the covert operator  $\cap$ . How can they ever be arguments of object-level predicates?

- (93) John collected mushrooms yesterday.
- Kind interpretation:  
John collected  $\cap$ (mushrooms) yesterday.  
#‘John collected “the mushroom-kind” yesterday.’
  - Intuitive interpretation:  
 $\exists x.x$  is a mushroom (plural object) and John collected  $x$  yesterday

Chierchia proposes that we can map kinds back to the properties that gave rise to them, by applying  $\cup$ ; he calls this the *derived kind predication*.

- (94)  $\exists x.x$  is in  $[\cup\cap(\text{mushrooms})]$  and John collected  $x$  yesterday, where  $[\cup\cap(\text{mushrooms})]$  could be read as the set of instantiations of the mushroom-kind.

### An empirical argument: scope

Main difference between ordinary indefinites and derived kind-predicates: ordinary indefinites take different scopes; derived kind-predicates always take the narrowest scope.

- (95) a. Mary didn't buy books. (only narrow)  
b. Mary didn't buy a book. (wide and narrow?)  
c. Mary didn't buy some books. (only wide)

<sup>1</sup>I'm leaving the analysis of singular kinds aside, see Dayal (1992, 2004).

- (96) a. John is looking for a policeman. (both scopes)  
 b. John is looking for some policemen. (both scopes?)  
 c. John is looking for policemen. (only narrow scope)
- (97) a. Some lego pieces are in each box. (only wide scope?)  
 b. A lego piece is in each box. (wide or narrow?)  
 c. Lego pieces are in each box. (only narrow scope)

In Czech, the situation is a bit more complicated because bare plurals can have either kind readings or definite readings (there is no definite article):

- (98) a. Maruška si nekoupila nějaké knížky. (only wide)  
 b. Maruška si nekoupila nějakou knížku. (only wide)  
 c. Maruška si nekoupila knížky. (only narrow, or definite?)  
 d. Maruška si nekoupila knížku. (only narrow, or definite?)
- (99) a. Honza hledá nějaké policisty. (both scopes)  
 b. Honza hledá nějakého policistu. (both scopes)  
 c. Honza hledá policisty. (only narrow scope, or definite)  
 d. Honza hledá policistu. (only narrow, or definite)
- (100) a. Někaké kostky lega jsou v každé krabici. (both scopes)  
 b. Někaká kostka lega je v každé krabici (both scopes)  
 c. Kostky lega jsou v každé krabici. (only narrow scope, or definite)  
 d. Kostka lega je v každé krabici. (only definite?)

## 5 Bare NPs and information structure

### 5.1 Topic vs. focus

Krámský (1972); Cohen and Erteschik-Shir (2002); Krifka (2003); Dayal (2004), a.o.: Bare NPs that are topics are definite and bare NPs that are focus (or not topic) are indefinite.

Czech examples from Krámský (1972):

- (101) a. Kniha je na stole.  
 b. Na stole je kniha.
- (102) a. Otevřely se dveře a mladá dívka vešla.  
 b. Otevřely se dveře a vešla mladá dívka.

There are some clear “exceptions”, e.g. the news title (from Běličová and Uhlířová 1996):

- (103) Řidič zavinil smrt tří lidí.

Theories about why this might be:

- Cohen and Erteschik-Shir (2002): Topics are of type  $e$  and therefore automatically referential (definite). Foci are of type  $\langle e, t \rangle$  and under their existential readings are incorporated into verbs.
- Dayal (2004): The default interpretation is referential. Foci can be construed as predicates, in which case they are non-referential (for the idea that foci are predicates, see, e.g. Wedgwood 2003).

### Pilot experiment: design

**Material:** Bare singular NPs in intransitive sentences and in contexts, which suggest (by means of world knowledge) that there are more entities that satisfy the NP descriptive content.

**Experimental factor:** Position of the NP: initial vs. final.

**Hypothesis:** The initial position will force the definite and hence uniqueness reading (in conflict with the world knowledge, which dictates that there should be more entities in the situation).

**Examples of items** (10 items in total; each participant saw each item only in one of the two conditions):

- (104) a. Karel vstoupil do jídelny. Židle stála u ledničky. [initial NP]  
 b. Karel vstoupil do jídelny. U ledničky stála židle. [final NP]  
 V jídelně byla jen jedna židle. [indicates definite reading]  
 Je možné, že v jídelně bylo více židlí. [indicates indefinite reading]
- (105) a. Až v noci půjdeš naší ulicí, tak si dávej pozor. Lampa přestala svítit. [initial NP]  
 b. Až v noci půjdeš naší ulicí, tak si dávej pozor. Přestala svítit lampa. [final NP]  
 V ulici je jen jedna lampa. [indicates definite reading]  
 Je možné, že v ulici je více lamp. [indicates indefinite reading]

### Results

Figure 1 shows the proportion of the choice of the second option, which corresponds to the indefinite interpretation.

- In general, indefinite interpretations were preferred over definite ones (cca 75%).
- There was a main effect of the experimental factor: Indefinite interpretations were selected less for NPs in the initial position (59%) than for NPs in the final position (90%).

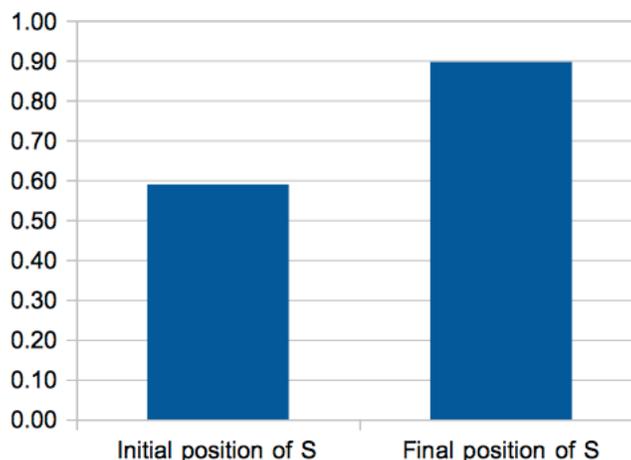


Figure 1: Proportion of indefinite readings

## Discussion

A *strong version of the hypothesis* was not confirmed: Topicality (initial position) is not sufficient to force a definite reading on a bare singular NP.

The results are compatible with a *weak version of the hypothesis*: Topicality (initial position) increases the probability of definite interpretations.

## 5.2 Accent

Hypothesis: Accent could determine the definiteness of bare NPs (suggested e.g. by Hakulinen 1955; Diesing 1992; Kratzer 1995). Some particular hypotheses:

- Non-accented NPs are definite (only accent matters).
- Non-accented initial NPs are definite (both accent and position matters).

One could then design a similar experiment that would include a prosodic factor, alongside with the positional factor:

- (106) Až v noci půjdeš naší ulicí, tak si dávej pozor.
- |                            |                         |
|----------------------------|-------------------------|
| a. Lampa přestala SVÍTIT.  | [initial, non-accented] |
| b. LAMPA přestala svítit.  | [initial, accented]     |
| c. Přestala svítit LAMPA.  | [final, accented]       |
| d. ?Přestala SVÍTIT lampa. | [final, non-accented]   |

## 5.3 Structural position and word order alternations (scrambling)

Hypothesis: Concerning transitive structures, VP-internal arguments are indefinite and VP-external arguments are definite (or at least presuppositional); proposals for Germanic: Diesing (1992, 1996); Kratzer (1995); de Hoop (1996); von Stechow (1998); Choi (1999).

- (107) I don't know if he sent us any papers with mistakes in them. But if
- a. ??a mistake in this paper is serious, it has to be sent back.
  - b. there is a serious mistake in this paper, it has to be sent back.

Diesing (1992): Arguments of *stage-level* predicates are VP-internal (and hence indefinite); arguments of *individual-level* predicates are VP-external (and hence generic).

- (108) a. [<sub>TP</sub> Firemen T [<sub>VP</sub> are [<sub>AP</sub> intelligent]]. (generic)  
 b. [<sub>TP</sub> T [<sub>VP</sub> Firemen [<sub>V'</sub> are [<sub>AP</sub> available]]. (indefinite)
- (109) a. Hasiči jsou inteligentní. (generic)  
 b. Hasiči jsou k dispozici. (indefinite)

For objects, scrambling can have an impact on the interpretation:

- (110) a. ... weil er oft [<sub>VP</sub> ein Buch kauft].  
 because he often a book buys  
 '...because he often buys a book (a potentially different book).'

- b. ... weil er **ein Buch** oft [VP kauft].  
 because he a book often buys  
 ‘... because he often buys a book (one and the same book).’ German

Similar proposals for Slavic: Biskup (2006, 2011); Mykhaylyk (2011).

- (111) a. Taras [VP čytaje **knyžku**].  
 T. reads book  
 ‘Taras reads a/some/a certain/the book.’  
 b. Taras **knyžku** [VP čytaje].  
 T. book reads  
 ‘Taras reads a certain/the book.’ Ukrainian, from Mykhaylyk (2011)

Šimík and Wierzba (to appear): We present experimental evidence that scrambling has no impact on specificity or definiteness in Czech; both definite bare NPs and indefinite bare NPs scramble equally well:

- (112) a. Jak bylo na dovolené? Karel se tak těšil, že uvidí zámek v Hluboké.  
 b. Kvůli němu jsme nakonec **zámek** navštívili. (definite)  
 (113) a. Jak bylo na dovolené? Před odjezdem mi Karel říkal, že ještě nikdy neviděl žádný zámek.  
 b. Kvůli němu jsme nakonec **zámek** navštívili. (indefinite)

## 5.4 Contrastive topicalization

There are cases where contrastive topicalization make non-definite interpretations more easily available.

- (114) a. Děti si hrají všude.  
 b. ?Dítě si hraje všude. (only definite?)  
 c. Takové/To [dítě]<sub>CT</sub> si hraje všude.  
 (115) a. Muži tráví v obchodě maximálně deset minut.  
 b. ?Muž tráví v obchodě maximálně deset minut. (only definite?)  
 c. Takový/To [muž]<sub>CT</sub> tráví v obchodě maximálně deset minut.

There are cases where contrastive topics resist being modified by demonstratives, despite their essentially anaphoric nature.

- (116) a. V místnosti bylo několik chlapců a dívek. (# Ti) chlapci hráli karty a (# ty) dívky se dívaly na televizi.  
 b. V místnosti bylo několik chlapců. #(Ti) Chlapci se dívali na televizi.

## References

- Abney, Stephen. 1987. The English noun phrase in its sentential aspect. Doctoral Dissertation, MIT, Cambridge, MA.
- Aguilar-Guevara, Ana. 2014. Weak definites: Semantics, lexicon, and pragmatics. Doctoral Dissertation, Utrecht University.
- Aoun, Joseph, and Lina Choueiri. 2000. Epithets. *Natural Language & Linguistic Theory* 18:1–39.
- Baker, Mark. 2003. *Lexical categories: Verbs, nouns, and adjectives*. Cambridge: Cambridge University Press.
- Biskup, Petr. 2006. Scrambling in Czech: Syntax, semantics, and information structure. In *University of British Columbia Occasional Papers in Linguistics 1: NWLC 21: Proceedings of the 21st Northwest Linguistics Conference*, ed. Seok Koon Chin and Atsushi Fujimori, 1–15. Vancouver, WA: University of British Columbia.
- Biskup, Petr. 2011. *Adverbials and the phase model*. Amsterdam: John Benjamins.
- Brame, Michael. 1982. The head-selector theory of lexical specifications and the nonexistence of coarse categories. *Linguistic Analysis* 10:321–325.
- Běličová, Helena, and Ludmila Uhlířová. 1996. *Slovanská věta*. Praha: Euroslavica.
- Carlson, Greg N. 1977. Reference to kinds in English. Doctoral Dissertation, University of Massachusetts, Amherst.
- Carlson, Greg N., and Francis J. Pelletier, ed. 1995. *The generic book*. Chicago, IL: The University of Chicago Press.
- Carlson, Greg N., Rachel Sussman, Natalie Klein, and Michael Tanenhaus. 2006. Weak definite noun phrases. In *NELS 36: Proceedings of the 36th Annual Meeting of the North East Linguistic Society*, ed. Christopher Davis, Amy Rose Deal, and Yuri Zabbal, 179–196. Amherst, MA: GLSA Publications.
- Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6:339–405.
- Choi, Hye-Won. 1999. *Optimizing structure in context: Scrambling and information structure*. Stanford, CA: CSLI Publications.
- Clark, Herbert. 1975. Bridging. In *Theoretical issues in natural language processing*, ed. R. C. Schank and B. L. Nash-Webber. New York: Association for Computing Machinery.
- Cohen, Ariel, and Nomi Erteschik-Shir. 2002. Topic, focus, and the interpretation of bare plurals. *Natural Language Semantics* 10:125–165.
- Corazza, Eros. 2005. On epithets qua attributive anaphors. *Journal of Linguistics* 41:1–32.
- Dayal, Veneeta. 1992. The singular-plural distinction in Hindi generics. In *SALT 2: Proceedings from the 2nd Conference on Semantics and Linguistic Theory*, ed. Chris Barker and David Dowty, 39–58. Columbus, OH: Ohio State University Press.
- Dayal, Veneeta. 2004. Number marking and (in)definiteness in kind terms. *Linguistics and Philosophy* 27:393–450.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.
- Diesing, Molly. 1996. Semantic variables and object shift. In *Studies in comparative Germanic syntax, vol. 2*, ed. Samuel David Epstein and Höskuldur Thráinsson, 66–84. Dordrecht: Kluwer.
- Dryer, Matthew S. 2013a. Definite articles. In *The world atlas of language structures online*, ed. Matthew S. Dryer and Martin Haspelmath. Leipzig: Max Planck Institute for Evolutionary Anthropology. URL <http://wals.info/chapter/37>.
- Dryer, Matthew S. 2013b. Indefinite articles. In *The world atlas of language structures online*, ed. Matthew S. Dryer and Martin Haspelmath. Leipzig: Max Planck Institute for Evolutionary Anthropology. URL <http://wals.info/chapter/38>.
- Elbourne, Paul. 2008. Demonstratives as individual concepts. *Linguistics and Philosophy* 31:409–466.
- Elbourne, Paul. 2013. *Definite descriptions*. Oxford: Oxford University Press.
- Elbourne, Paul D. 2005. *Situations and individuals*. Cambridge, MA: MIT Press.
- von Fintel, Kai. 1998. Evidence for presuppositional indefinites. Manuscript, MIT, Cambridge, MA.
- Frege, Gottlob. 1879. *Begriffsschrift: Eine der arithmetischen nachgebildete Formelsprache des reinen Denkens*. Halle: Verlag von Louis Nebert.
- Hakulinen, L. 1955. *Razvitije i struktura finskogo jazyka II*. Moskva.
- Hawkins, John A. 1978. *Definiteness and indefiniteness: A study in reference and grammaticality prediction*.

- London: Croom Helm.
- Heim, Irene. 1982. The semantics of definite and indefinite noun phrases. Doctoral Dissertation, University of Massachusetts, Amherst.
- Heim, Irene. 1991. Artikel und Definitheit. In *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, ed. Arnim von Stechow and Dieter Wunderlich, 487–535. Berlin: Mouton de Gruyter.
- Heim, Irene. 2011. Definiteness and indefiniteness. In *Semantics: An international handbook of natural language meaning*, ed. Claudia Maienborn, Klaus von Heusinger, and Paul Portner, 1025–1058. Berlin: de Gruyter.
- de Hoop, Helen. 1996. *Case configuration and noun phrase interpretation*. Garland.
- Kamp, Hans, and Uwe Reyle. 1993. *From discourse to logic*. Kluwer.
- Krámský, Jiří. 1972. *The article and the concept of definiteness in language*. The Hague: Mouton.
- Kratzer, Angelika. 1995. Stage-level and individual-level predicates. In *The generic book*, ed. Greg N. Carlson and Francis J. Pelletier, 125–175. Chicago: The University of Chicago Press.
- Krifka, Manfred. 2003. Bare NPs: Kind-referring, indefinites, both, or neither? In *SALT 13: Proceedings from the 13th Conference on Semantics and Linguistic Theory*, ed. Robert B. Young and Yuping Zhou, 180–203. Ithaca, NY: CLC Publications. URL <http://elanguage.net/journals/index.php/salt/issue/view/296>.
- Link, Godehard. 1983. The logical analysis of plural and mass terms: A lattice theoretical approach. In *Meaning, use, and interpretation of language*, ed. Rainer Bäuerle, Christoph Schwarze, and Arnim von Stechow, 302–323. Berlin: de Gruyter.
- Mykhaylyk, Roksolana. 2011. Middle object scrambling. *Journal of Slavic Linguistics* 19:231–272.
- Prince, Ellen. 1981. Toward a taxonomy of given-new information. In *Radical pragmatics*, ed. Peter Cole, 223–255. New York: Academic Press.
- Schwarz, Florian. 2009. Two types of definites in natural language. Doctoral Dissertation, University of Massachusetts, Amherst.
- Šimík, Radek, and Marta Wierzba. to appear. The role of givenness, presupposition, and prosody in Czech word order: An experimental study. *Semantics & Pragmatics* .
- Wedgwood, Daniel. 2003. Predication and information structure: A dynamic account of Hungarian pre-verbal syntax. Doctoral Dissertation, University of Edinburgh.