Course Overview

patrick.grosz@uni-tuebingen.de / sarah.zobel@ds.uni-tuebingen.de

1. General Remarks

- **Our Goal:** – present challenges for a uniform analysis of pronouns
  – discuss possible ways of overcoming these challenges
  – show where the different approaches reach their limit
- **Approach:** We review core phenomena and datapoints in light of competing approaches that are currently on the market.
- **Disclaimer:**
  ⇒ We focus on the traditional class of pronouns, and specifically on 'definite' pronouns (e.g. *he, she*, *it*); we do not focus on tense/world/situation pronouns.
  ⇒ We focus on singular pronouns and their properties, including those that are shared by plural pronouns; we do not discuss the semantics of plural.

2. Plan for the Week

- **Monday (Day 1 = today) – Background**
  Overview of traditional approaches to pronouns (non-dynamic *vs* dynamic), which treat 3rd person pronouns (*he/she/it*) as individual variables.
- **Tuesday (Day 2) – Unification, I (3rd person pronouns)**
  Presentation of a current approach that uniformly analyzes all 3rd person pronouns as definite descriptions (e.g. *he* ⇝ *the man*); this culminates in a view that denies the existence of individual-variable-denoting expressions in natural language.
- **Wednesday (Day 3) – Unification, II (1st/2nd person pronouns)**
  Comparison of 1st/2nd person *vs.* 3rd person pronouns. Overview of traditional approaches to 1st/2nd person, and of recent developments, including the possibility of capturing 1st/2nd person expressions as definite descriptions as well.
- **Thursday (Day 4) – Challenges, I (3rd person pronouns)**
  We discuss the different classes of 3rd person pronouns that have been established in the last 20 years (e.g. strong *vs.* weak *vs.* clitic pronouns); we compare non-uniform and uniform analyses to these classes of pronouns.
- **Friday (Day 5) – Challenges, II (1st/2nd person pronouns)**
  We show that 1st/2nd person pronouns have an additional impersonal use, in which they compare to impersonal pronouns (e.g. *one*), and behave more like indefinite descriptions (*a man*), and less like definite descriptions (*the man*).

Pronouns as variables

- Our goal is to critically evaluate two traditional approaches that treat pronouns as individual variables in natural language: static (section 1) *vs*. dynamic (section 2).

1. Pronouns in a Non-Dynamic Semantics[1]

- Non-dynamic approaches typically give rise to a fundamental distinction between referential pronouns, (1a-b), and bound pronouns, (1c).

(1) a. *referential anaphoric pronouns:*
John called. **He**'ll drop by later. (***he*** = John)

b. *deictic (referential) pronouns:*
[speaker points at John:] **He** did it! (***he*** = John)

c. *bound anaphoric pronouns:*
No actress resents **her** cat. ¬∃x[x is an actress ∧ x resents **x**'s cat]

1.1 Basic Assumptions and the interpretation of referential pronouns

- Personal pronouns in the 3rd person (e.g. *he*, *she*, *it*) are standardly interpreted as variables that are interpreted with respect to an assignment function *g*.

(2) for any assignment function *g*,
$[\![\ [_{pron}\ X]_i\ ]\!]^g = g(i)$ (≈ the *i*-th member of *g*) (Büring 2011:975)

⇒ In the case of referential anaphoric pronouns (i.e. 'free' pronouns), *g* is generally assumed to be provided by the utterance context.

(3) a. **Mary** went to a party yesterday. **She** had a good time.
b. $[\![she_5]\!]^g = g(5)$ *where g includes:* [5 → Mary]

⇒ The ϕ-features of pronouns are traditionally analyzed as presupposition triggers (cf. Heim & Kratzer 1998), as in (4) for example (3a).

(4) $[\![FEM]\!]^g = \lambda x : x \text{ is a female } . x$

⇒ The numerical indices can be seen as representing discourse referents (DRs), i.e. the index *5* in (3b) is the discourse referent (DR) associated with Mary.

⇒ Postal (1969:206) argues, based on examples like his (5), that pronouns require an explicit overt antecedent (cf. *Mary* in (3a)). This suggests that the addition of DRs to the assignment function *g* is highly constrained.

(5) a. **Max's parents** are dead and he deeply misses **them**. (*them* ≈ *his parents*)
b.# Max is an *orphan* and he deeply misses **them**. (*them* ≈ *his parents*)

[1] The non-dynamic part of today's class is based on Büring's (2011) handbook article.

⇒ But it can be shown that referential pronouns without overt antecedents are acceptable when a discourse referent is established in the context, see (6).

⇒ For (6), Greene et al. (1994) argue that, due to *community membership*, a mention of "Gentlemen Prefer Blondes" can establish Marilyn Monroe as a discourse referent for an antecedentless ("unheralded") pronoun.

(6) a. *Context:* Two people are watching Madonna's "Material Girl" video.
A: The set is a rip-off from "Gentlemen Prefer Blondes".
B: Is that the one where **she**'s standing over the grate and **her** dress blows up?
(Greene et al. 1994:512)

b. $[\![\text{she}_7]\!]^g = [\![\text{her}_7]\!]^g = g(7)$ *where g includes:* [7 → Marilyn Monroe]

⇒ Another case of antecedentless pronouns are (non-anaphoric) deictic pronouns. While the distinction between *anaphoric* and *deictic* pronouns is blurry, the latter directly refer to an individual in the context.

– Deictic pronouns are typically accompanied by a deictic gesture (e.g. pointing a finger), but this may also be absent/implicit, cf. (7).

(7) *Context:* John enters the room 10 minutes after the meeting started.
Ann to Mary: I can't believe it. **He**'s late again.

1.2 Assignment functions, accessibility and salience

- One question that arises is how to model concepts such as *salience* and *accessibility* by means of assignment functions. (This is a current line of inquiry.)
  ⇒ Büring (2011): The context may not just provide an assignment function *g*, but also an ordering amongst the DRs in *g*.
  ⇒ Since *g* is a list/sequence, new DRs are added (e.g. via an indefinite) at its end, and the last DR is automatically the maximally salient one.
  ⇒ Topic-marking, using definite descriptions, pointing gestures, etc, serve to reorganize the ordering in *g*. In this spirit, we can change (3b) to (8).

(8) $[\![\text{she}]\!]^g$ = the final (= most salient) female individual in the sequence *g*
(from Büring 2011:976)

⇒ Ambiguous examples like (9) challenge the formalization of such an account, since it is still not fully understood how salience is 'managed' here.

(9) Norma hates Sally. She criticized her novel. (Büring 2011)

⇒ *Implicit causality* (e.g. Garvey & Caramazza 1974) is a phenomenon where the matrix predicate co-determines salience in a *because*-clause, (10a-b).

⇒ The puzzle: if the entire sentence is interpreted with respect to *g* (in a non-dynamic semantics), how can *g*'s contents be sensitive to the matrix verb?

(10) a. Sally frightens Mary because **she** is a strange girl. (preferred: *she* = Sally)
b. Sally fears Mary because **she** is a strange girl. (preferred: *she* = Mary)
(Hartshorne & Snedeker 2013, based on psycholinguistic findings)

- Since this is a relatively new line of research, we continue to assume the traditional view (section 1.1), in which pronouns come with numerical indices.

1.3 Bound pronouns

- To model semantic binding, Büring (2005) introduces the binding operator *β*:

(11) For any natural number *n*, *Binder Index Evaluation Rule* (Büring 2005:85)
$[\![\beta_n\ Y]\!]^g = \lambda x\ .\ [\![Y]\!]^{g[n \to x]}(x)$

⇒ An illustration is given in (12).[2]

(12) a. [[no countess] [β_7 [brought [her$_7$ dog]]]]

b. $[\![$brought her$_7$ dog$]\!]^g$ = λy . y brought g(7)'s dog

c. $[\![\beta_7$ brought her$_7$ dog$]\!]^g$ =
λx . $[\![$brought her$_7$ dog$]\!]^{g[7 \to x]}$(x) =
λx . [λy . y brought g[7→x](7)'s dog](x) =
λx . x brought g[7→x](7)'s dog =
λx . x brought x's dog

⇒ Due to the definition of Büring's *Binder Index Evaluation Rule*, we derive the c-command requirement on syntactic binding.

1.4 Coreference *vs* Binding

- Two DPs in a single clause can corefer (i.e. receive the same value from the assignment function *g*), or enter a binding relationship where one binds the other.
- Sometimes, coreference and binding yield *different* readings for a sentence, (13).
  ⇒ When the readings are *identical*, binding blocks coreference (Reinhart 1983).

(13) During an emergency lockdown, only [**HARry**]$_F$ has access to **his** room.

a. *binding ('bound reading'):*
Only Harry$_F$ β_2 has access to his$_2$ room.
⇝ *presupposition:* 'Harry has access to Harry's room.'
⇝ *entailment:* _____ (discuss)

b. *coreference ('coreferential reading'):*
Only Harry$_F$ has access to his$_{2=Harry}$ room. g = [2 → Harry]
⇝ *presupposition:* 'Harry has access to Harry's room.'
⇝ *entailment:* _____ (discuss)

1.5 Introducing non-uniformity: pronouns as 'definite descriptions in disguise'

- It is known that certain uses of personal pronouns challenge the analysis of pronouns as variables, as illustrated in (14)-(15) (from Büring 2011:978).
- In (14), *he / it* cannot simply refer back to a salient individual. (Discuss: why?)

[2] Note: Büring (2005:101) assumes that object quantifiers are interpreted *in situ* via a syntactically represented type-shifting operator *κ*; binding is thus independent from movement (quantifier raising).

(14) a. *pronoun of laziness*
This year **the president** is a Republican, but one fine day, **he** will be a member of the Green party.

b. *paycheck pronoun*
Mary, who deposited **her paycheck** at the ATM, was smarter than any woman who kept **it** in her purse.

- Moreover, in (15a), the referents of *it* covary with the donkeys owned by the different farmers even though binding out of a relative clause is impossible, (15b).

(15) a. *donkey pronoun (can have an antecedent in a relative clause)*
Every farmer [who owned **a donkey**] had Lucy vaccinate **it**.

b. *'regular' bound pronoun (cannot have an antecedent in a relative clause)*
* The woman [who met **every boy**] liked **him**.

⇒ Such pronouns prompt an ('e-type') analysis where they are interpreted as complex DPs, i.e. as 'definite descriptions in disguise', illustrated in (16).

(16) Every farmer [who owns **a donkey**] grooms **it**.
≈ Every farmer [who owns **a donkey**] grooms **the donkey (that he owns)**.

- **Initial challenges (Heim 1982):** definite descriptions (e.g. *the man*) have a uniqueness presupposition, which is not satisfied for the donkey pronouns in (17):

(17) a. If **a man** is in Athens, **he** is not in Rhodes.
(⇏ there is a unique man who is in Athens)

b. Everyone who bought **a sage plant** here bought eight others along with **it**.
(⇏ there is a unique sage plant that s/he bought)
(Büring's 2011:979 versions of the examples from Heim 1982:89,93)

⇒ However, as a matter of fact, there are definite DPs that are equally acceptable in these examples (Büring 2011:980).[3]

(18) a. If **a man** is in Athens, **that man** is not in Rhodes.

b. Everyone who bought **a sage plant** here bought eight others along with **that sage plant**.

⇒ Heim (1990) restricts quantification in these examples to minimal situations.

(19) a. for every situation *s*, if *s* is a minimal situation containing **a man in Athens**, then *s* can be extended to a minimal situation *s*' containing **the unique man in Athens in *s*** not being in Rhodes

b. for every person *y* and minimal situation *s* of *y* buying **a sage plant** here, there is an extension *s*' of *s* in which *y* buys eight other sage plants along with **the unique sage plant he buys in *s***
(Büring 2011:980, with emphasis added)

- **Problem:** We no longer have a uniform approach to pronominal semantics.

[3] Interestingly, the preferred D^0 in most of these cases is a demonstrative, e.g. *that*, or a possessor, e.g. *his*, and not *the* (Büring 2011:980); cf. Löbner (1985) for relevant discussion.

2. Pronouns in a Dynamic Semantics

2.1 A brief introduction to basic DRT (Kamp & Reyle 1993)[4]

2.1.1 Discourse representation structures (DRSs) and truth-conditions

- The central objects in DRT are **Discourse Representation Structures (DRSs)** which are designed to keep track of all literal, linguistically given information in an arbitrarily large text/discourse.

- A DRS is composed of two parts:
  - the DRS-universe – a set of variables representing discourse referents (DRs)[5]
  - a set of DRS-conditions

- DRSs are built incrementally from syntactic representations on the basis of a set of construction rules.[6]

  (20) a. *Mary likes David Hasselhoff.*
  b. $[\, x, y \mid \text{Mary}(x), \text{David-Hasselhoff}(y), x \text{ likes } y]$

  $\Rightarrow$ The construction rule for proper names states that (i) a new DR is introduced in the universe, (ii) the condition of the DR being called that name is added to the DRS-conditions, and (iii) in the syntactic structure, the proper name is replaced by the variable chosen for the DR.[7]
  $\Rightarrow$ A verbal expression for which all complement expressions have been replaced by DRs is (more or less) added as is to the set of conditions.

- In a multi-sentential text, each new sentence augments the previously constructed DRS.

- In contrast to a static semantic framework, the truth-conditions of a sentence is not built up directly from the syntactic structure of a sentence. That is, the DRS that is for a sentence is not identical to the truth-conditions of the sentence.

- In DRT (strict) **truth-conditions are determined for DRSs** in a second step.

  (TRUTH) A DRS is true iff there are individuals corresponding to the discourse referents in its universe which satisfy the given conditions. (cf. K&R p.74)

- The truth-condition for the DRS in (20-b) is given in (21).

  (21) $[\, x, y \mid \text{Mary}(x), \text{David-Hasselhoff}(y), x \text{ likes } y]$ is true iff
  $\exists x \exists y[\text{Mary}(x) \;\&\; \text{David-Hasselhoff}(y) \;\&\; x \text{ likes } y]$

- The existential aspect of (TRUTH) is one of the central characteristic properties of DRT, and has direct consequences e.g. for how definites and indefinites are treated.

---

[4] Kamp & Reyle (1993) is abbreviated as K&R throughout this handout.

[5] Note that the DRS-universe does not contain the actual individuals refered to with the different referential expressions. This has to be kept in mind since sometimes the variables inside the universe are usually called "the discourse referents".

[6] K&R use a variant of Generalized Phrase Structure Grammar (GPSG) as their syntactic theory of choice. However, the rules can be easily adapted for trees created by any other brand of syntax.

[7] In a static system, proper names are standardly analyzed as individual denoting expressions (type *e*), see Heim & Kratzer (1998). For a more recent predicational view see Session 2.

2.2 Anaphoric pronouns in DRT[8]

2.2.1 A comment on anaphoric relations

- K&R assume that anaphoric relations pertain between pronouns, on the one hand, and discourse referents in the DRS-universe that have been established prior to the interpretation of the pronouns, on the other hand. Crucially, the anaphoric relation is *not* between the pronoun and another linguistic expression in the previous discourse.

- Which discourse referent constitutes the antecedent of a given anaphoric pronoun is inferred by the interpreter on the basis of at least three criteria:
  - **pronominal form** (and other knowledge about grammar and meaning)
  - the **discourse context**
  - **knowledge about the situation** described in the discourse

(22) *Billy hit Johnny with his baseball bat.* ***He*** *burst into tears.* (K&R, example 1.15)

$\Rightarrow$ previous discourse and world knowledge guides the choice of DR for *he*, i.e. Johnny.

2.2.2 The construction rule for pronouns

- (CR.PRO) regulates how the semantic contribution of a pronoun is integrated into the existing DRS when encountered in a syntactic structure.

> (CR.PRO)
>
> 1. Introduce a new discourse referent into the universe of the DRS. (= CR.PN.1)[a]
> 2. Introduce a condition obtained by substituting this referent for the NP-node of the local configuration that triggers the rule application in the syntactic structure containing this configuration and delete the syntactic structure. (= CR.PN.3, CR.PN.4)
> 3. Add a condition of the form $\alpha = \beta$ where α is a new discourse referent and β is a suitable discours referent chosen from the universe of the DRS.
>
> [a](CR.PN) is the construction rule for proper names (cf. K&R p.65).

- The following steps illustrate the application of (CR.PRO) for the mini-text in (23), which results in one DRS.

(23) *Mary likes David Hasselhoff.* ***She*** *adores* ***him****.*

- ***Mary likes David Hasselhoff*****:** $[\, x, y \mid \text{Mary}(x), \text{David-Hasselhoff}(y), x \text{ likes } y]$

- **New input:** the syntactic structure of *He adores him*. Top-down interpretation: the first pronoun is *he* $\rightarrow$ application of (CR.PRO)
  - **Step 1:** A new discourse referent z is introduced.
  - **Step 2:** The variable z replaces the NP *he* in the input structure: [z [*adores him*]]
  - **Step 3:** A new condition is added that identifies z with an appropriate discourse referent among those that have been previously introduced.

[8]For an overview of Classical DRT, its extensions, and a comparison to other dynamic systems see Geurts and Beaver (2011).

(24) $[\, x, y, z \mid \text{Mary}(x), \text{David-Hasselhoff}(y), x \text{ likes } y, z = x, [z[\text{adores him}]]]$

$\Rightarrow$ *she* points to a female individual; x introduced by *Mary* represents a female, established DR; hence, z can be identified with x.

- The same three steps are performed analogously for the second pronoun *it*; the relevant, old discourse referent is y. After that, only the verbal material is added.

(25) $[\, x, y, z, u \mid \text{Mary}(x), \text{David-Hasselhoff}(y), x \text{ likes } y, z = x, u = y, z \text{ adores } u]]$

- Given the identities in the DRS conditions, (25) is equivalent to the simpler DRS in (26).

(26) $[\, x, y \mid \text{Mary}(x), \text{David-Hasselhoff}(y), x \text{ likes } y, x \text{ adores } y]$

2.2.3 Gender marking on pronouns (ϕ-feature information)

- Determination of the antecedent for an anaphoric pronoun is guided by the gender information of the pronoun. In the previous example this information was treated as system-external information guiding the search for a suitable, previously established DR.
- The restrictions introduced by ϕ-feature information can be made part of the system. K&R discuss two options.
- **First option**:
  (i) add the fourth clause (CR.PRO.4) which introduces a condition on the gender of the referent to (CR.PRO) and the construction rules for other expressions that introduce discourse referents (=NPs)
  (ii) add the condition to the third clause of (CR.PRO) that the chosen antecedent be of the same gender

(CR.PRO.4) Add a condition of the form Gen(α)=β where α is the new discourse referent and β the gender value. (Implemented in Ch. 3, p.238.)[9]

- **Second option:**
  only amend the third clause of (CR.PRO), and recover the needed gender information of the potential antecedents via the conditions in the DRS from the lexicon.
- Both are also potential alternatives to treat other ϕ-feature information (e.g. number).

2.3 Accessibility: (in-)accessible discourse referents

- **A natural question at this point:**
  Is every discourse referent introduced a NP is accessible for subsequently occurring pronouns, or are some "off limits"?

(27) *Jones does not have a wife.* ***#He*** *likes* ***her****.*
(Intended: *her* picks up the DR introduced by *a wife*)

$\Rightarrow$ It seems that the discourse referent introduced by *a wife* is inaccessible for (CR.PRO)[10]

[9] The function Gen has to be introduced as a primitive function from discourse referents to their gender. Note that this gender-function Gen has nothing to do with the generic operator *Gen*, see Session 5.

[10] Note that the oddness in (27) is not due to *wife* being a relational noun. The same oddness arises for regular nouns, as in '*John doesn't have an umbrella. It is red.*' (Schlenker 2011b:374). To simplify matters, we therefore ignore that *wife* is a relational noun.

- The reason for the inaccessibility seems to be **negation**. K&R connect sentence negation with the speech act of denial: material in the scope of negation forms its own sub-DRS (inside the main DRS), which is negated as a whole.[11]

- ***Jones does not have a wife***: $[\ x \mid \text{Jones}(x), \neg[\ y \mid \text{wife}(y), x \text{ has } y]\ ]$

  $\Rightarrow$ **Assumption:** the surface position of *not* represents its scope position!

- ***He likes her*:** The material is added to the global DRS.

  (28) $[\ x, z, u \mid \text{Jones}(x), \neg[\ y \mid \text{wife}(y), x \text{ has } y], z = x, u = ??, z \text{ likes } u]$

  $\Rightarrow y$ inside the negated sub-DRS is inaccessible as an antecedent for *her*; the intended interpretation cannot be constructed.

  (ACCESS) A referent x is accessible to a pronoun α iff the condition γ from which α is to be eliminated via (CR.PRO) belongs to the DRS containing x, or to one which is subordinate to it.

2.4 Capturing bound and donkey pronouns in DRT

2.4.1 Universal quantification in DRT

- the construction rule introduces a special sub-DRS structure, a so-called "conditional structure".[12]

  (29) a. *Every boy likes David Hasselhoff*
  b. $[\ y \mid \text{David-Hasselhoff}(y), [\ x \mid \text{boy}(x)] \Rightarrow [\ \mid x \text{ likes } y]\ ]$

  $\Rightarrow$ **Intuition:** the DRS on the right extends the DRS on the left

- The analysis in (29-b) suggests the following extension to (ACCESS):

  (ACCESS+) Discourse referents introduced in the left DRS of a conditional structure are accessible in the right DRS.

- **Truth-conditions for conditional structures:** (i) variables representing a discourse referent introduced in the left DRS of a conditional structure are universally quantified, and (ii) conditions in the left and right DRSs are connected via material implication.

  (30) The DRS (29-b) is true iff $\exists y[\text{David-Hasselhoff}(y)\ \&\ \forall x[\text{boy}(x) \rightarrow x \text{ likes } y]]$

2.4.2 Bound and donkey pronous

- Example of a **pronoun bound by a universal quantifier**: *Every boy likes **himself***.[13]

  (31) a. $[\ \mid [\ x \mid \text{boy}(x)] \Rightarrow [\ y \mid x = y, x \text{ likes } y]\ ]$
  (equivalent to: $[\ \mid [\ x \mid \text{boy}(x)] \Rightarrow [\ \mid x \text{ likes } x]\ ]$)
  b. Truth-conditions: $\forall x[\text{boy}(x) \rightarrow \text{likes}(x, x)]$

[11] This treatment of negation together with the truth-conditions for DRSs amounts to saying that no individuals can be found for the discourse referents that satisfy the given conditions.

[12] Note that discourse referents that are introduced by proper names are always added to the main DRS.

[13] Note that no discourse referents have been introduced in the global DRS.

- Interim conclusion for bound pronouns:
  - bound pronouns, as such, do not exist as a special use—they are just like any other anaphoric pronoun
  - the covariation found with bound pronouns is captured via the interpretation rule for conditional structures

- In analogy to bound pronouns, **no special donkey uses exist** in DRT.

  (32) *Every farmer who has a wife loves **her**.*

- The construction and interpretation rules introduced so far suffice to account for examples like (32):

  (33) a. $[\ |\ [\ x, y\ |\ \text{farmer}(x), \text{wife}(y), x \text{ has } y] \Rightarrow [\ z, u\ |\ z = x, u = y, z \text{ loves } u]\ ]$
  (equivalent to: $[\ |\ [\ x, y\ |\ \text{farmer}(x), \text{wife}(y), x \text{ has } y] \Rightarrow [\ |\ x \text{ loves } y]\ ]$)

  b. $\forall x \forall y[\text{farmer}(x)\ \&\ \text{wife}(y)\ \&\ \text{has}(x, y) \rightarrow \text{loves}(x, y)]$

  $\Rightarrow$ the material of the relative clause is put into the left sub-DRS (it is part of the restrictor of *every*), which is accessible from the right

  $\Rightarrow$ By (ACCESS+): discourse referents introduced in the restrictor/the antecedent are accessible to variables introduced in the scope/consequent

- Donkey pronouns also occur in conditionals; but: like universal quantifiers, the construction rule for conditionals introduces a conditional structure.

  (34) *If a farmer has a wife, **he** loves **her**.*

  a. $[\ |\ [\ x, y\ |\ \text{farmer}(x), \text{wife}(y), x \text{ has } y] \Rightarrow [\ z, u\ |\ z = x, u = y, z \text{ loves } u]\ ]$
  (equivalent to: $[\ |\ [\ x, y\ |\ \text{farmer}(x), \text{wife}(y), x \text{ has } y] \Rightarrow [\ |\ x \text{ loves } y]\ ]$)

  b. $\forall x \forall y[\text{farmer}(x)\ \&\ \text{wife}(y)\ \&\ \text{has}(x, y) \rightarrow \text{loves}(x, y)]$

  $\Rightarrow$ Note that (33-a) and (34-a) are identical.

- **Conclusion:** So far, Classical DRT seems to provide a uniform, dynamic approach to pronominal meaning:
  - free anaphoric pronouns, bound pronouns, and donkey pronouns are all treated with the same construction rule (CR.PRO)
  - the choice of antecedent DRs is restricted by (ACCESS+) for all uses
  - the covariation found with bound pronouns and with donkey pronouns is captured via the interpretation rule for the conditional structures, which occur in these cases

- **Question:** Can additional data be found that cannot be accounted for by the strategy outlined above?

3. Do dynamic approaches need 'definite descriptions in disguise'?

- Consider the type of examples in (35), due to Geach (1980[1962]:156-157), known in the literature as *bathroom sentences*.

  ⇒ Such examples have been taken to argue that even dynamic approaches sometimes require an 'e-type' strategy, where pronouns resemble definite descriptions rather than denoting individual variables (e.g. Chierchia 1992).

(35) a. Either this house doesn't have **a bathroom** or **it**'s in a funny place.
(Barbara Partee's example, as quoted in Roberts 1989:702)

b. Either John does not own **a donkey** or he keeps **it** very quiet.
(Evans 1977)

⇒ The expectation is that the antecedents in (35) fail to provide an individual-type discourse referent that is accessible to the pronoun, cf. (36).

(36) a. This house doesn't have **a bathroom**. # **It**'s in a funny place.

b. John does not own **a donkey**. # He keeps **it** very quiet.

- If pronouns are definite descriptions in disguise, (35a-b) are no longer puzzling.

  ⇒ Their core properties are reduced to presuppositions of the definite article, as long as existence/uniqueness is restricted to a salient situation, cf. (37).

(37) a. Either this house doesn't have **a bathroom** or **the bathroom** is in a funny place.

b. Either John does not own **a donkey** or he keeps **the donkey** very quiet.

- We thus arrive at the following picture of (non-)uniformity in traditional static and traditional dynamic approaches, in Table 1.

  ⇒ **Interim conclusion:** neither view provides a fully uniform analysis.

Table 1:

	traditional static	**traditional dynamic**
referential pronoun	individual variable	individual variable
bound pronoun	individual variable	individual variable
donkey pronoun	def. description	individual variable
'bathroom' example	def. description	'e-type' strategy

- Notably, both types of models have been developed further in recent years, focusing on a re-unification of the different uses of pronouns.

  ⇒ We focus on recent developments in a static approach to pronominal semantics (Day 2: a generalized *definite description* approach).

  ⇒ For relevant discussion of the recent developments in dynamic approaches to pronominal semantics, see Schlenker (2011a,b).

References

Büring, Daniel. 2005. *Binding Theory.* Cambridge: Cambridge Unviersity Press.

Büring, Daniel. 2011. Pronouns. In von Heusinger, Maienborn and Portner (eds.): *Semantics: An International Handbook of Natural Language Meaning. Vol. 2*. Berlin: Mouton de Gruyter, 971–995.

Chierchia, Gennaro. 1992. Anaphora and Dynamic Binding. *Linguistics and Philosophy* 15:111–183.

Elbourne, Paul. 2005. *Situations and Individuals*, Cambridge, MA: MIT Press.

Evans, Gareth. 1977. Pronouns, quantifiers and relative clauses (I). *Canadian Journal of Philosophy* 7: 467–536.

Garvey, Catherine, and Alfonso Caramazza. 1974. Implicit causality in verbs. *Linguistic Inquiry* 5: 459–464.

Geach, Peter. 1980[3][1962]. *Reference and Generality*, Ithaca, N.Y.: Cornell University Press.

Geurts, Bart. 2011. Accessibility and anaphora. In von Heusinger, Maienborn and Portner (eds.): *Semantics: an International Handbook of Natural Language Meaning. Vol. 2*. Berlin: Mouton de Gruyter, 1988–2011.

Geurts, Bart and David Beaver. 2011. Discourse Representation Theory. In *The Stanford Encyclopedia of Philosophy (Fall 2011 Edition)*, ed. Edward N. Zalta,
URL = <http://plato.stanford.edu/archives/fall2011/entries/discourse-representation-theory/>.

Greene, Steven B., Richard J. Gerrig, Gail McKoon and Roger Ratcliff. 1994. Unheralded Pronouns and Management by Common Ground. *Journal of Memory and Language* 33:511–526.

Hartshorne, Joshua, and Jesse Snedeker. 2013. Verb argument structure predicts implicit causality: The advantages of finer-grained semantics. *Language and Cognitive Processes* 28:1474–1508.

Heim, Irene. 1982. *The Semantics of Definite and Indefinite Noun Phrases*. PhD dissertation, University of Massachusetts at Amherst.

Heim, Irene. 1990. Donkey Pronouns and Donkey Anaphora. *Linguistics and Philosophy* 13:137–177.

Jacobson, Pauline. 2000. Paychecks, Stress, and Variable-Free Semantics. In Jackson and Matthews (eds.): *SALT X*. Ithaca, NY: Cornell University, 65–82.

Kamp, Hans and Uwe Reyle. 1993. *From Discourse to Logic: Introduction to Modeltheoretic Semantics of Natural Language, Formal Logic and Discourse Representation Theory*. Dordrecht: Kluwer Academic Publishers

Löbner, Sebastian. 1985. Definites. *Journal of Semantics* 4:279–326.

Postal, Paul. 1969. Anaphoric islands. *Chicago Linguistic Society* 5:205–239.

Reinhart, Tanya. 1983. *Anaphora and Semantic Interpretation*. University of Chicago Press.

Roberts, Craige. 1989. Modal subordination and pronominal anaphora in discourse. *Linguistics and Philosophy* 12: 683–721.

Schlenker, Philippe. 2011a. The Modularity of Meaning: Is Meaning Dynamic? Presentation at MIT ling 50. [http://www.youtube.com/watch?v=C_Ud0nkaZvE]

Schlenker, Philippe. 2011b. Donkey anaphora: the view from sign language (ASL and LSF). *Linguistics and Philosophy* 34:341–395.