Presupposition and Determinedness
Krahmer (1998, Ch. 7)

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Semantics C

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Main Idea: The discussion of Presuppositional DRT so far doesn't account for all of the presuppositional behavior of definites: they contain presuppositions of existence and what we will call **Determinedness**.

- Definites may be used non-anaphorically, uniquely, and anaphorically

(1) The king of France is bald.

(2) The king of France is bald. # Another king of France told me so.

(3) A boy and a man walk in the street. The man whistles.

Goal: Discuss four possible notions of Determinedness: *Uniqueness, Anaphoricity, Familiarity* and *Salience*.

The problem

Definite Descriptions Rule

Upon encountering an NP of the form 'the α', replace it with a new discourse referent x and prefix the current DRS with

∂	x
	x, α

- This rule makes definites 'triggers' for existential presuppositions, so '*the* α' presupposes the existence of α. This works for non-anaphoric uses like (1).
- The construction rule cannot account for the oddity in (2): nothing prohibits the existence of more than one king of France.

- It also fails for (3): nothing forces the x introduced by the indefinite *a man* to be the same x in the definite (Anaphoricity).

Thus, the construction algorithm is too weak: it correctly presupposes *Existence*, accounting for (1), but it fails to get *Uniqueness* (2) and *Anaphoricity* (3).

A possible solution:

- Multiple rules for definites to account for the behavior above. Usage of *the* is then ambiguous between these readings. Krahmer assumes that *the* is unambiguous. So we need one rule that gets the correct presuppositions in the correct contexts.

- We achieve this by adding an extra condition: DETERMINEDNESS

Revised Construction Rule - Definites

Upon encountering an NP of the form 'the α', replace it with a new discourse referent x and prefix the current DRS with

∂

x
$x \quad \alpha$ **Determined**$(x, \boxed{x\ \alpha})$

Where $\boxed{x\ \alpha}$ will be the set of conditions on x introduced by the Common Noun α. If α contains material which is moved out of the presuppositional DRS by the Revised Construction Algorithm, it is also moved out of the Determinedness condition.

Some logical tools

VALUE SET: A DRS represents properties expressed by the Common Noun (CN) and assigned to a free variable x. The *Value Set* is the set of objects to which the description is applicable.

(4) $\mathbf{VAL}(x, [\![\Phi]\!]_{M,g}) = \{d \in D \mid M, g[x/d] \models \Phi\}$

a. Read: *the set of objects which have the properties attributed to it by* Φ *in a model* M *and with respect to an assignment* g.

UNIQUE AND UPPERCLASS DENOTATOR

(5) a. $\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})$ is a UD if $|\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})| = 1$

b. $\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})$ is a UD if $|\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})| \geq 2$

Uniqueness, the most classical of classics

Following Frege and Strawson, we assume that definites presuppose *existence* and *uniqueness*.

- So we set **Determined**(x, Φ) = **Unique**(x, Φ)

(6) **Definition:** Unique
  a. $[\![\mathbf{Unique}(x, \Phi)]\!]^+ = \{g \mid |\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})| = 1$
  b. $[\![\mathbf{Unique}(x, \Phi)]\!]^- = \{g \mid |\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})| \neq 1$

- This works fine for (1-2): we correctly predict the existence of a unique king of France, excluding the existence of another king.
- In (3), we predict uniqueness as well. This is OK, since the uniqueness presupposition is supported in the model with only one man, namely the one introduced by *a man*.
  - But when we have more than one man in the model, we predict a contradiction since there are now two unique individuals x

(7) A man and a boy walk in the street. The man whistles. Another man follows them.

So pure uniqueness is too strong. It correctly predicts uniqueness (of course), but can't get the anaphoric relations quite right. We want to restrict Uniqueness somehow.

Restricting Uniqueness
We have seen how to add Context to Presuppositional DRT[1], so we can restrict **Unique** by restricting its application to the context C, and let C range over Discourse Referents.

Definition: Unique
$[\![\mathbf{Unique}^C(x, \Phi)]\!]^+ = \{g| \ |\mathbf{VAL}(x, [\![\Phi]\!]_{M,g}) \cap [\![C]\!]_g| = 1\}$
$[\![\mathbf{Unique}^C(x, \Phi)]\!]^- = \{g| \ |\mathbf{VAL}(x, [\![\Phi]\!]_{M,g}) \cap [\![C]\!]_g| \neq 1\}$

- We can now handle examples like (7)
  1. C begins empty.
  2. *a man* introduces a new DRef.
  3. *the man* refers to this unique DRef.
- But we cannot handle the facts in (1). There is no previous discourse referent for *the king of France* to grab onto.
- Context Sets are only useful for anaphoric definites, but don't work for non-anaphorics.

[1] see the wonderful handout from last chapter.

Anaphoricity

Another idea: definite NPs behave like anaphors

Heim's Novelty Familiarity Condition

1. if NP_n is [+def], it is preceded by an NP_n
2. if NP_n is [-def], it is not preceded by an NP_n

- We use the *Extended Novelty-Familiarity Condition*: a definite description presupposes existence and Anaphoricity.

Determined(x, Φ) = **Anaphoric**(x, Φ)

1. $[\![\text{Anaphoric}(x, \Phi)]\!]^{+} = \{g|\ [\![x]\!]_g\ \textit{defined}\ \}$
2. $[\![\text{Anaphoric}(x, \Phi)]\!]^{-} = \{g|\ [\![x]\!]_g\ \textit{not defined}\ \}$

- The Anaphoricity condition on x is satisfied iff x has already been introduced and is accessible
  - This works for the anaphoric definites, but fails for the novel ones like *The king of France is bald*: no referent has been introduced that is acceptable.

<u>Possible Solution: Accommodation</u>

(8) **Rule for accommodation for presuppositions** (Lewis, 1979): If at a time t something is said that requires presupposition P to be acceptable, and if P is not presupposed just before t, then -*ceteris paribus* and within certain limits- Presupposition P comes into existence at t.

- One certain limit: **cross-reference constraint** - we accommodate an antecedent for a definite NP is it is *not entirely novel.*

  (9) A boy and a man walk in the street. The man's wife follows quietly.

- But this still doesn't work for non-anaphoric definites: they are entirely novel

Familiarity

- Krahmer gives some historical background, from which we draw two conclusions:

  (10) Familiarity is an old notion.

  (11) UDs satisfy the familiarity constraint.

(12) #A tallest frenchman would like to have a new XXXXL shirt.

- the indefinite doesn't work here because *tallest frenchman* is a genuine unique.

Hypothesis: A singular Common noun satisfies the familiarity condition when a single object can be selected to which the Common Noun applies.

- Problem: Common Nouns are often applicable to more than one individual. So all of these individuals will satisfy familiarity.
- Solution: Allow linguistic context to select one individual.

Assume that definite descriptions presuppose existence and familiarity.

- This gives the Presuppositional DRT condition **Determined**(x, Φ) = **Familiar**(x, Φ), interpreted as below:

Definition: Familiar
$[\![\text{ Familiar}(x, \Phi)]\!]^{+} = \{g \mid |\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})| = 1 \text{ or } \exists v \in \text{Dom}(g)(v \neq x \ \& \ g(v) = g(x))\}$
$[\![\text{ Familiar}(x, \Phi)]\!]^{-} = \{g \mid |\mathbf{VAL}(x, [\![\Phi]\!]_{M,g})| \neq 1 \ \& \ \forall v \in \text{Dom}(g)(v \neq x \Longrightarrow g(v) \neq g(x))\}$

read: *The familiarity of an object x with property Φ is supported in a model M with respect to an assignment g if either the value set of x in Φ given M, g is a singleton, or there is a previously introduced object which (by the existence presupposition) has the right properties. It is rejected if the value set of x in Φ is not a singleton and there is no previously introduced object with the right properties.*

- This accounts for the non-anaphoric and unique uses in (1) and (2)
  - If the model has only one KoF, x, then the variable for the definite y must refer to this (existing, familiar) individual.
  - If there is more than one KoF, then familiarity cannot be satisfied (presupposition fail)
  - If there is no KoF, then neither existence or familiarity is satisfied
- It also accounts for the examples in (3), even when it contains several male individuals
  - The indefinite *a man* introduces a DRef. Familiarity is satisfied per possible extension.
- and Familiarity gets cases like (9):
  - *the man* is checked for familiarity
  - then the wife of this man is checked, per choice of man

We can also define Novelty in terms of familiarity

Definition: Novel
$\text{Novel}(x, \Phi) = \neg[|\text{Familiar}(x, \Phi)]$

- this accounts for (12): it leads to presupposition failure in any model with only one tallest frenchman - this one frenchman will be familiar, and so the definite article is required

<u>The problem with Familiarity:</u> The notion of Familiarity uses both *uniqueness* (to select one individual) and *anaphoricity* (selecting the individual from the linguistic context).

- This allows Familiarity to avoid the problems that the previous accounts encounter in isolation
- But it undermines the assumption that the definite is unambiguous by putting the ambiguity into one notion.

Salience

Finally, we discuss the notion that definites refer to the *most salient* element satisfying the descriptive content

(13) The pig is grunting, but the pig with the floppy ears is not grunting.

- This is not an anaphoric use. The context must contain two pigs, each of which must be picked out on the basis of their descriptions (*grunting, floppy ears*)
- We can use this to pick out unique objects too, since they will be the only elements matching the descriptive content

<u>A dynamic characterization of Salience</u>

- Each object in the domain of discourse has a *salience weight*
  - At the beginning of discourse, all objects have the same salience weight
- Definite descriptions refer to the object with the highest salience weight that also has the correct descriptive content

<u>How do we increase salience?</u>

- Heim (1982): either (i) use an NP that refers to the object or (ii) use an indefinite whose predicate is true of the object
- In Presuppositional DRT increase to salience weight is done per assignment

(14) If a farmer has a farm-hand, then *the farm hand* will feed the animals.

- for the conditional with an assignment g, the assignments $g\{x, y\}h$ s.t. $h(x)$ is a farmer and $h(y)$ is a farm-hand are the relevant
- for h the objects for $h(x)$ and $h(y)$ become more salient

Salience in Presuppositional DRT

- we add to the set of variables a function-variable sw, a function from the domain D of individuals to the natural numbers IN
  - this is interpreted with respect to assignment g as $g(sw) \in IN^D$

We now interpret Presuppositional DRT with respect to all finite assignments whose domain includes sw

- We replace F with F^{sw}
  - where F = the set of finite assignments, mapping finite subsets of the set of variables to the domain of individuals
  - where $F^{sw} = \{f \in F \mid sw \in \mathbf{Dom}(f)\}$
- $\Lambda^{sw} \in F^{sw}$ = the beginning of discourse, with all objects equally salient
  - $\mathbf{Dom}(\Lambda^{sw}) = \{\text{sw}\}$
  - $\Lambda^{sw}(sw)$ = the constant function mapping every element of D to 1

How does an object get more salient?

- upon introduction of a new DRef, we not only move to a new assignment, but adjust the weight of sw so that the new referent raises in salience and all others stay the same
  - $h(sw)(h(x)) = g(sw)(h(x)) + 1$
  - $\forall d \in D(d \neq h(x) \Rightarrow h(sw)(d) = g(sw)(d))$
- Define Determinedness as $\mathbf{Salient}(x, \Phi)$, interpreted as below where $\mathbf{Salient}(x, \Phi)$ is supported in a model M with respect to an assignment g iff *g(x)* is more salient than all other elements in the value set, and rejected if there is an object d which satisfies the descriptive content Φ and is at least as salient as *g(x)*.

Definition: Salient
$[\![$ Salient $(x, \Phi)]\!]^+ = \{g | \forall d \in \mathbf{VAL}(x, [\![\Phi]\!])$
$(d \neq g(x) \Rightarrow g(sw)(g) < g(sw)(g(x)))\}$
$[\![$ Salient $(x, \Phi)]\!]^- = \{g | \exists d \in \mathbf{VAL}(x, [\![\Phi]\!])$ $(d \neq g(x)$ &
$g(sw)(g) \geq g(sw)(g(x)))\}$

- This gets the non-anaphoric and uniqueness examples: if France has no king, neither existence or salience are satisfied. If France has more than one king, then all will be equally salient.
- It also gets the anaphoric cases right

(15) A man and a boy walk in the street. The man whistles.

Consider a model where *man* is a LD, i.e. there is more than one, call them *a*,*b*.

1. The introduction of the indefinite *a man* yields two output assignments, one which makes $a > b$ and the other $a < b$
2. the introduction of the definite introduced the DRef z, which can refer to a or b
3. we thus consider four output assignments (2 possibilities for each previous output), with the Salience condition satisfied only in those cases where z refers to the most salient man

Determinedness as Salience thus accounts for those cases where definites are non-anaphoric, unique, and anaphoric. Are there differences?

- Yes, in the case of an LD with more than two antecedents

(16) A black Chihuahua and a white one walk in the park. # The Chihuahua barks.

- The examples above satisfies Familiarity, but not Salience (both are the same salience)
- Salience is more flexible, since we can 'fine-tune' the notion of salience increase
- It also gives an intuitive and uniform account of definites, more in line with the assumption the the definite article is unambiguous

Extending the analysis to other definites

Krahmer speculates on how we can account for other definites like *Non-identity Anaphora, Proper names* and how we can incorporate (non-linguistic) *surroundings*

Non-identity Definites

(17) A man died in a car crash yesterday evening. *The Amsterdam father of four* was found to have been drinking.

(18) John read a book about Schubert. He wrote a letter to the author.

- In (17) The (italicized) definite introduces new information. This is problematic: what is the most salient *father of four*?
- In (18) how are the presuppositions for *the author* satisfied?
- One suggestion is that we take into account *dependencies* such as the fact that books have authors.

Krahmer argues that once we have a theory of *Dependencies*, the Salience condition will do the rest

- We do this through the use of hidden arguments, which are meaning postulates (in the lexicon)
- The definite article can optionally trigger disclosure of the hidden argument, which then modifies the noun, and requires the hidden argument to be salient
- This has problems, but once the nature of dependencies is resolved, Salience will suffice

<u>Other Definites</u>

- **Pronouns:** refer to the most salient (male,female,object) in the discourse at that point
- **Proper Names:** presuppose a salient individual with that name. This presupposition is represented at the level at which it originates
- **Demonstratives:** behave like definite descriptions, with additional means that serve to further constrain meaning

<u>Surroundings</u>
Definition: Surroundings
If s is a speaker, a an addressee, $\delta_1, ..., \delta_n$ are objects which are 'apt for pointing', t is a time and p is a place, then a surrounding S is definied as:
$S =< s, a, (\delta_1, ..., \delta_n), t, p >$
Definition 11

1. $[\![i]\!]_S = s, [\![you]\!]_S = a, [\![now]\!]_S = t, [\![here]\!]_S = p$
2. $[\![\nearrow^\delta x]\!]^+ = \{< g, h > \mid g\{x\}h \& h(x) = \delta\}$
   $[\![\nearrow^\delta x]\!]^- = \{< g, h > \mid \forall h(g\{x\}h \Rightarrow h(x) \neq \delta)\}$