

# Definite reference is not the same as reference to the most salient referent

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## semantics of the definite determiner: uniqueness

Definite referential expressions (*the so-and-so*) are often thought of as referring to unique instances of the kind denoted by the NP.

*The current German President  
is a lawyer.*

would thus refer to Christian Wulff,  
implying that there is currently  
exactly one German President.

But when I say

*The microphone is black.*

I am not assuming that there is exactly one microphone in the whole world. Rather, it seems that the discourse context restricts the uniqueness condition to the limited domain of our picture, and that, within that domain, there is exactly one microphone.



Discourse context may mean

- the situational context, as in the microphone example, or
- the linguistic context, as in cases of anaphora:

*John has a son and a daughter. The boy is eight.*

In both cases the uniqueness condition holds, even though in a limited domain.

If the uniqueness condition is not satisfied, the use of the definite determiner leads to incoherence :

*John has two sons. #The boy is eight.*

Cf. also

*His failure to meet the target was not A reason for his dismissal; it was THE reason.*

meaning that there were no other reasons for his dismissal.

**In sum: definite reference is based on uniqueness within an appropriate domain of reference.**

## semantics of the definite determiner: uniqueness questioned

In some situations, though, there is clearly more than one referent that satisfies the descriptive content of the NP  
- but the use of the definite determiner is still entirely appropriate.

Consider somebody talking about the family dog, saying (perfectly acceptably and comprehensibly):

*The dog got in a fight with another dog. – I'll have to see to it that the dog doesn't get near that other dog again.*

*(McCawley 1979)*

Here the discourse domain would seem to contain two dogs.

**How does the uniqueness condition apply here?**

## semantics of the definite determiner: uniqueness $\Rightarrow$ salience

Perhaps the idea of “**uniqueness within a restricted domain**” may, after all, not be feasible, and another idea may be required.

David Lewis (1979:178) proposed the notion of **salience** to replace the uniqueness idea:

*It is not true that a definite description "the F" denotes x if and only if x is the one and only F in existence.*

*Neither is it true that "the F" denotes x if and only if x is the one and only F in some contextually determined domain of discourse.*

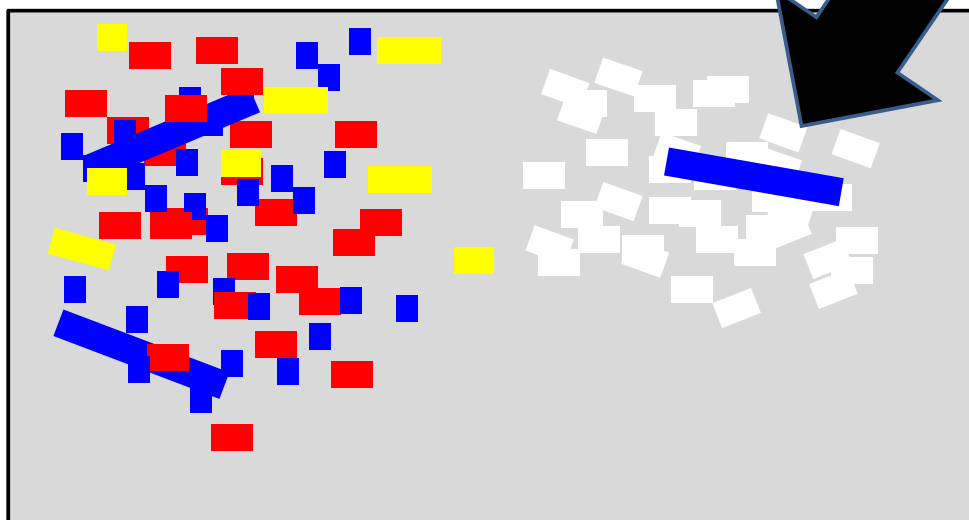
*The proper treatment of descriptions must be more like this: "the F" denotes x if and only if x is the most salient F in the domain of discourse, according to some contextually determined salience ranking.*

## semantics of the definite determiner: uniqueness $\Rightarrow$ salience

The salience idea seems highly plausible, particularly with regard to situation-embedded spoken discourse and particularly with regard to visual salience.

Anecdotal evidence from an earlier experiment:

(Lego® blocks) "Take the long blue one."



## semantics of the definite determiner: uniqueness $\Rightarrow$ salience

Meanwhile a number of theories provide parameters or algorithms for the prominence or salience ranking of discourse referents (e.g., Ariel 1985, Gundel et al. 1993, Grosz et al. 1995, von Stechow 1996, Roberts 2003) .

Although there seems to be the intention to cover discourse salience generally, there is no explicit account except for narrowly linguistic parameters.

Unclear if an overall reduction of definite reference to cognitive salience can succeed.

It is at least conceivable that definiteness may have more than one source, salience (in whatever exact sense) being just one of them.

## experiment: salience vs. uniqueness

We designed a visual world eye-tracking experiment to look at the interaction and relative influence of

- **situational uniqueness,**
- **anaphora, and**
- **visual salience**

for definite descriptions in spoken discourse vis-a-vis a visually represented situation.

## experiment: salience vs. uniqueness

### Global hypotheses:

A if definite reference does not rest on uniqueness but on salience, the salience condition should lead to referent identification at least as quickly and reliably as the uniqueness condition.

B if definite reference does not rest on anaphoric identification but on salience, the salience condition should lead to referent identification at least as quickly and reliably as the anaphora condition.

C if anaphora, uniqueness, and salience each independently support definite reference, then the combination of any two of these conditions should lead to faster or more reliable referent identification for definite descriptions than each on their own.

## experiment: modified visual world / materials

Subjects were viewing photographs of Playmobil® sceneries on a computer screen and listened to short narratives related to the pictured scenery.

The narratives consisted of

- a headline-type introduction,
- a sentence starting with an NP that introduced an animate referent and, later on, another NP introducing a further animate referent.
- The final sentence started with a definite NP (the target), followed by further material.

## experiment: modified visual world / technicalities

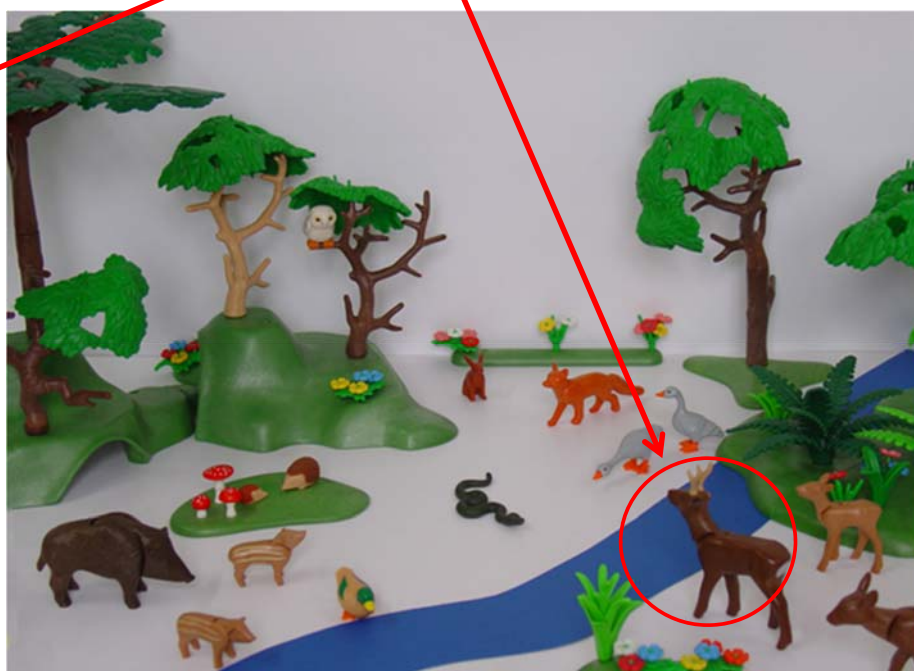
- 27 participants, University of Osnabrück students, paid or course credits, age 22 average
- 32 stimulus sets, 4 per condition
- visual stimuli presented via 30" Apple Cinema HD display
- auditory stimuli via ER-4B Earphones
- eye movements recorded (Eye Link II, head-mounted) at 250 Hz
- randomized presentation
- ROI defined manually
- time course of fixations in slots of 100 ms
- stimulus validity controlled

Condition 1a: [previous mention, unique reference]

*In the wood.*

*A stag is standing at the bank of the river and is carefully watching the snake on the other side.*

*The stag is frightened because the snake is dangerous.*

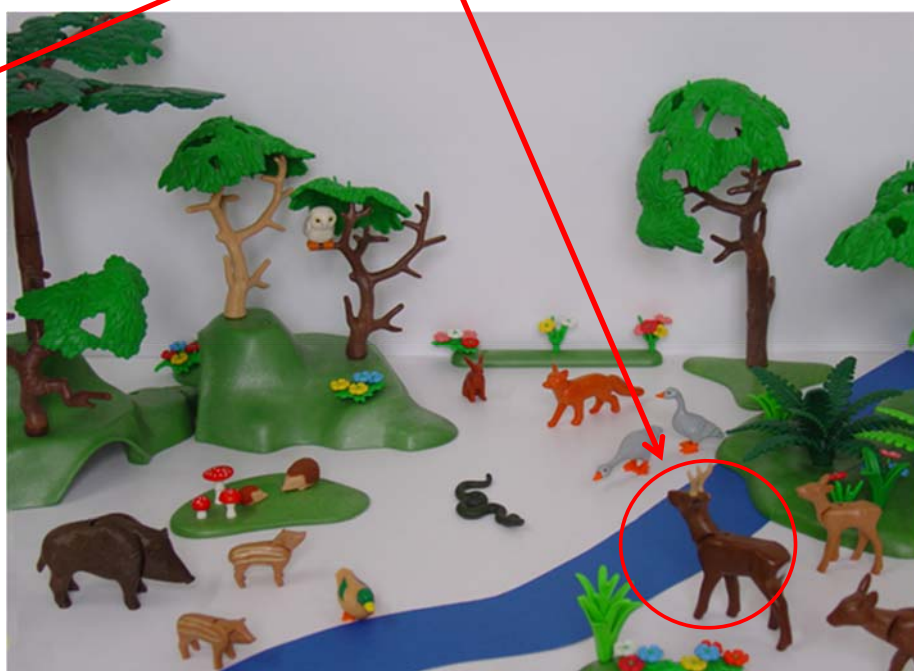


Condition 1a: [previous mention, unique reference]

*Im Wald.*

*Ein Hirsch steht am Flußufer und beobachtet gespannt die Schlange auf der anderen Seite.*

*Der Hirsch hat Angst, weil die Schlange gefährlich ist.*



*In the wood.*

*A stag is standing at the bank of the river and is carefully watching the snake on the other side.*

*The stag is frightened because the snake is dangerous.*

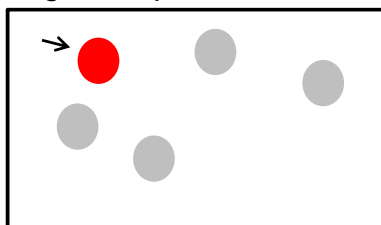


## design: the parameters

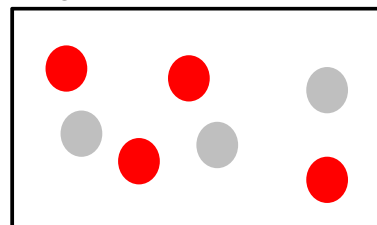
apart from previous mention of the target, we varied the following parameters:

**uniqueness :**

(a) target unique

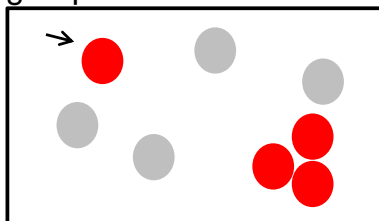


(b) target one of several competitors

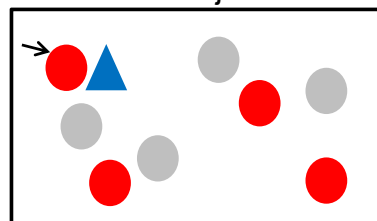


**visual salience :**

(c) target isolated, competitors grouped



(d) target close to previously mentioned object



## materials: implementing the salience conditions

### Condition 2c:

[no previous mention, non-unique reference, target isolated & competitors grouped]

*In the park.*

*A park keeper has just checked the pond and has been watched by the grandmother.*

*The child is getting ready to go home with its grandmother.*



## materials: implementing the salience conditions

### Condition 2d:

[no previous mention, non-unique reference, target close to previously mentioned object]

*In the classroom.*

*There is an exercise on the blackboard that the teacher wrote up there.*

*The child has quickly found the solution and is glad about the praise.*



# design: combination of parameters

	a	b	c	d	
1	unique referent prev. mention	non-unique ref. prev. mention	non-unique ref. prev. mention salience by isolation	non-unique ref. prev. mention salience by closeness	anaphora
2	unique referent 1 <sup>st</sup> mention	non-unique ref. 1 <sup>st</sup> mention	non-unique ref. 1 <sup>st</sup> mention salience by isolation	non-unique ref. 1 <sup>st</sup> mention salience by closeness	1 <sup>st</sup> mention
	uniqueness		salience		

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19/28

## results for anaphora conditions 1 a,b,c,d

no significant differences

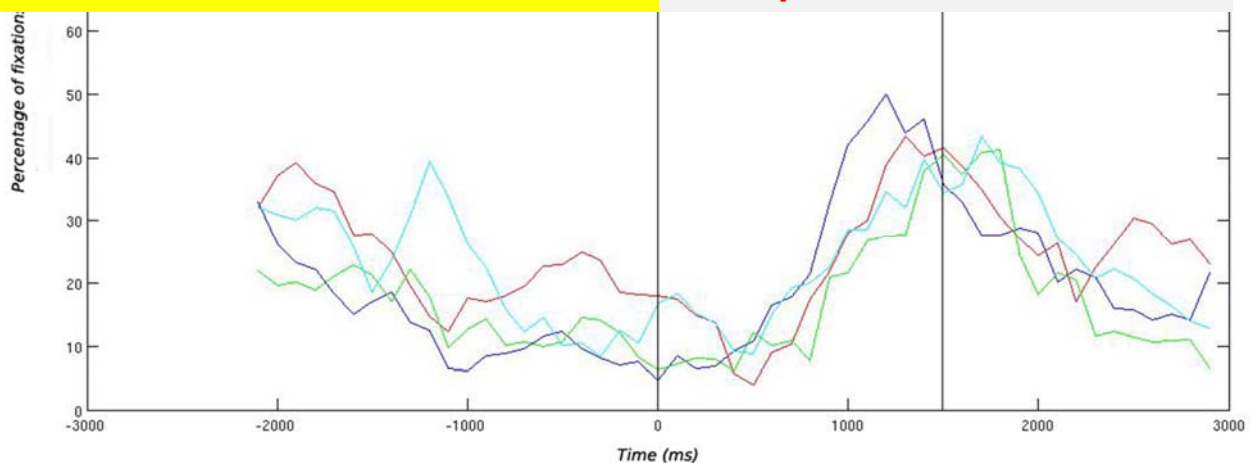
1a - 1b	0.417	1b - 1c	0.256
1a - 1c	0.051	1b - 1d	0.756
1a - 1d	0.286	1c - 1d	0.454

### anaphora conditions (1 a,b,c,d):

step rise of focussing frequency for the target, starting at about 200ms, and peaking at about 1200-1300ms

### conditions 1

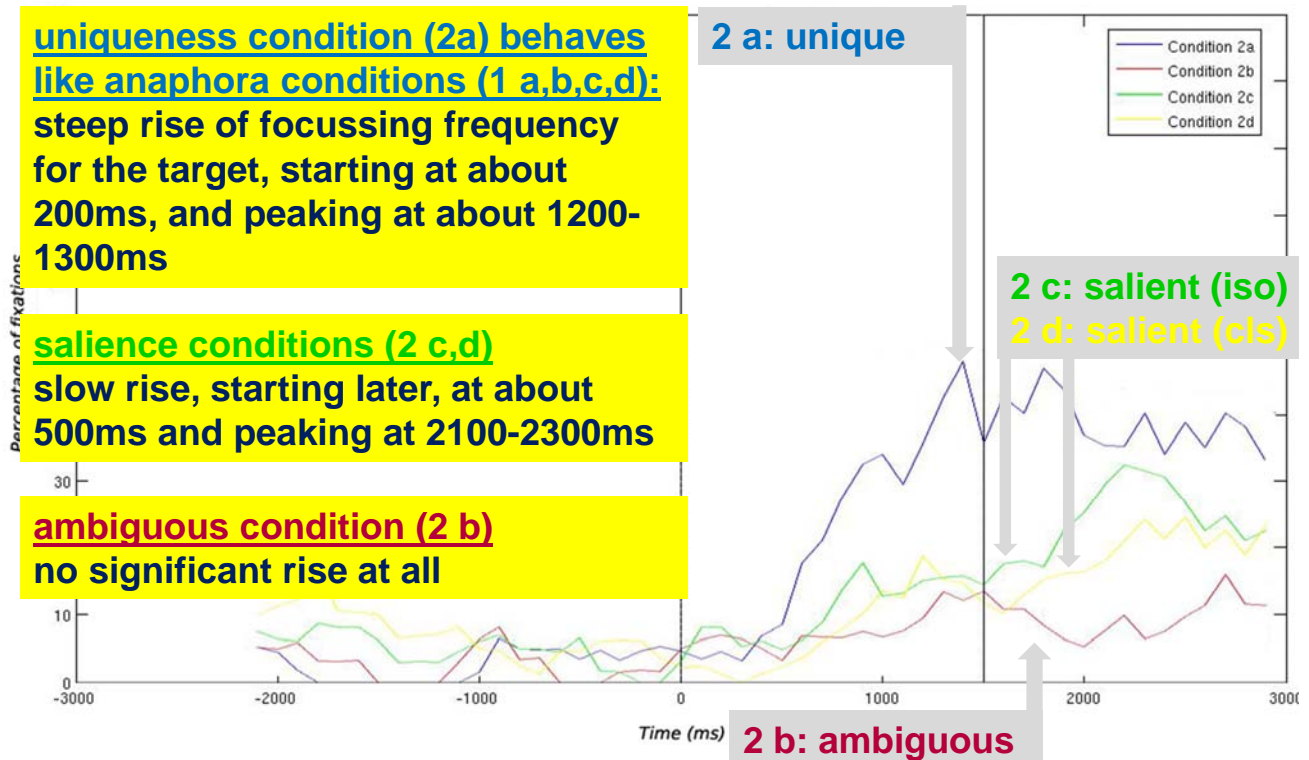
- a. **anaphoric**, unique
- b. **anaphoric**
- c. **anaphoric**, salient
- d. **anaphoric**, salient



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20/28

## results for 1<sup>st</sup> mention conditions 2 a,b,c,d



## results: significant differences

ANOVA comparison between conditions	Conditions	p-value	
	1a - 2a	0.799	anaph/unique vs. unique
	1b - 2b	0.000	anaph vs ambiguous
	1c - 2c	0.033	anaph vs salient
	1d - 2d	0.001	anaph vs salient
	2a - 2b	0.000	unique vs. ambiguous
	2a - 2c	0.000	unique vs. salient
	2a - 2d	0.000	unique vs. salient
	2b - 2c	0.510	ambiguous vs. salient
	2b - 2d	0.889	ambiguous vs. salient
	2c - 2d	0.585	salient vs. salient

The focussing behaviour shows that

- the uniqueness of a referent and its previous mention each on their own effect the same ease of comprehension of a definite NP in the situation of the experiment.
- No significant enhancement was found, where these conditions support each other, or are supplemented by visual salience.
- Where neither previous mention nor uniqueness support the comprehension, salience factors still support the comprehension process, although in a degraded fashion.

## results: all hypotheses rejected

### Hypotheses:

A if definite reference does not rest on uniqueness but on salience, **the salience condition should lead to referent identification at least as quickly and reliably as the uniqueness condition.**

B if definite reference does not rest on anaphoric identification but on salience, **the salience condition should lead to referent identification at least as quickly and reliably as the anaphora condition.**

C if anaphora, uniqueness, and salience each independently support definite reference, **then the combination of any two of these conditions should lead to faster or more reliable referent identification for definite descriptions than each on their own.**

## Discussion

### Different cognitive processes involved

- A**     **Discourse anaphora and unique reference in the discourse domain**, where the discourse domain is fixed by preceding discourse and visual information.
- B**     **Visual salience** (visually isolated position or visual closeness to an already salient object)

### Definiteness is not based on salience:

**Degraded results for B** in conditions 2 c,d where only **B** operates, compared to conditions 1 a,b,c,d and 2a, where **A** operates: later and slower rise in focussing, later and lower peaks.

**No facilitation through B** in conditions 1 c,d where both **A** and **B** operate, compared to conditions 1 a,b, where only **A** operates.

## Discussion

Our results make

**discourse anaphora and  
unique reference in the discourse domain**

look like **the primary processes** in reference determination,

while

**visual salience**

comes to look more like a **repair process**, starting later and being less effective.

### A reasonable defence of definiteness-as-salience theorists:

"salience" is just a term under which we subsume a variety of factors, like recency of mention, information structure, grammatical relations, agreement constraints, prosodic prominence, etc. (plus possibly more that still need to be discovered).

All these factors interact in different weighting and order in one or the other algorithm to determine the referent of a definite description.

But this is not the alternative to the uniqueness condition that David Lewis was hoping for.

# Thanks