

# Local compositionality, aspects of naming, and deviant identity

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## 1. Some ideas to the local compositionality

Connection of substitutional definition of compositionality (Hodges) with context dynamic.

Paul Dekker, “The Live Principle of Compositionality”, 2014:

The meaning of an utterance is the change it brings about in the situation in which it is uttered. The meaning of a sentence is its systematic contribution to its meanings in a variety of situations.

Description of the expression’s contributions to the meanings in many cases shows its linguistics (communicative) role.

Daniel Rotshild, Seth Yalcin, “Three notions of dynamicness in language”, 2016.

It very well may be that there is an attractive characterization of what a “truly dynamic” compositional semantics amounts to in terms of the concept of a local context ... So the question remains: what (if anything) makes for a “truly dynamic” compositional semantics?

Michael Franke, “The Evolution of Compositionality in Signaling Games”, 2015

The recognition of compositionality requires the ability to distinguish between flexible and constant characteristics of situations (states of affairs).

## 2. My suggestions

My hypothesis consists in that the compositionality phenomenon only seems to be a domineering norm the separate exclusions of which are easily explained and be subjected to the general law by applying more precise analysis. Below, I will try to demonstrate that in reality compositionality to some extent is always by non-compositionality.

The cognitive value of compositionality results from the fact that we fixate the lack of constancy in the contribution that is made by components of expression into its meaning as we are moving from one situation of usage, or context, into another. The latter allows us to differentiate in communication the focal from the peripheral.

### 3. Definition of meaning function $\mu$ on the structure of situations

- All that belongs to procedural understanding of meaning belongs to properties of situations and to the relation between them.
- Every announcement of meaningful expression is an agent's act and transforms the situation into the new situation.
- Sense as algorithm correlates with pictures, which are representation of propositions, and with LF with which syntactical structure stands in bidirectional optimisation (Blutner).
- Thus, sense forms expectations of compositionality appearances if calculation of meaning takes place – relation of speaker perspective.
- Cyclicity may be avoided by way of applying a number of limitations.

- Agents:  $a, b, c, \dots$
- $E$  – set of wf expressions.
- $e^\wedge$  – is a procedure (algorithm) of calculating a denotation.
- $e^\wedge$  can be represented as  $\gamma(d_1^\wedge, \dots, d_n^\wedge)$ , where  $\gamma$  – a function, generating procedures out of procedures.
- $S$  –  $D^n$ -situations – agent, world, aim, etc. :  $s, s_1, s_2, \dots$ ,
- time-ordering  $<$  on  $S$ ,
- relations on the  $S^2 \times A \times E$ :
  - $SR$  – factual transformation of  $s_i$  into  $s_k$  as a result of announcing  $e$  by  $a$ ,
  - $ESR$  – expected transformation (by  $a$ ) of  $s_i$  into  $s_k$   
as a result of announcing  $e$  by  $a$ .

### Factual meaning of $e$ for $a$ :

$$\mu(e, a) =_{\text{Df}} \{\langle s_i, s_k \rangle : s_i SR(a, e) s_k\}.$$

### Expexted (aimed) meaning of $e$ for $a$ :

$$\varepsilon\mu(e, a) =_{\text{Df}} \{\langle s_i, s_k \rangle : s_i ESR(a, e) s_k, s_k \in S^*\}, \text{ where } S^* \text{ is the preferable set.}$$

### Accumulated meaning of $e$ for $a$ in the situation $s_n$ :

$$\alpha\mu(e, a)(s_n) =_{\text{Df}} \{\langle s_i, s_k \rangle : s_i SR(a, e) s_k, \text{ где } s_i, s_k < s_n\}.$$

## Definitions:

A component  $e$  of  $A$  is **local** (strong) compositional on the pair  $\langle s_i, s_k \rangle$  in respect of  $a$ , if for some (for every)  $h$  is true, that  $\langle s_i, s_k \rangle \in \mu(A, a)$  &  $\langle s_i, s_k \rangle \notin \mu(A(e/h), a)$ .

A component  $e$  of  $A$  is **global** (strong) compositional in respect of  $a$ , if  $e$  is local compositional on the every pair  $\langle s_i, s_k \rangle$  in respect of  $a$ .

## 4. Situational extension of expression's content

“Free enrichment of an expression with unarticulated components” or “hidden indexes” (Recanati 2002; Hall 2008).

$A^{SitExt}$  from  $A$ :

$A$  – focal content in context,

$A^{SitExt}$  – full content with minimal context dependency.

Semantic programs:

$A^{SP} = p := \kappa_1, \dots, \kappa_m$ .

$(A^{SitExt})^{SP} = (Q(A, B_1, \dots, B_m))^{SP} = p := \emptyset$ , where  $B_1, \dots, B_m$  – express the propositions, which meaning covers the context parameters  $\kappa_1, \dots, \kappa_m$ ,  $Q$  – enrichments function.

**Example:** “Oops!” said Mary, after she had met an elephant on the narrow path.

$s_1$ . A picture in comics.      Focus: “Oops!”  
Periphery:     $\kappa_1$ : elephant  
                   $\kappa_2$ : narrow path  
                   $\kappa_3$ : said (exclaimed, ...)  
                   $\kappa_4$ : Mary, she (Kat, girl, ...)  
                   $\kappa_5$ : after ... had met (faced, run into, ...),

$(\text{Oops!})^{\text{SP}} = p := \kappa_1, \dots, \kappa_5$ .

$s_2$ . Sound track without a picture.

Focus: “Oops!”

No explicated periphery.

To  $(\text{“Oops!”})^{\text{SitExt}}$ :

“An elephant, “Oops!””

“Narrow path, “Oops!””

“An elephant, narrow path, “Oops!””

“Mary had met an elephant, “Oops!””

“Mary had met an elephant, on the narrow path, “Oops!””

- $s_3$ . *a*-aspect: Mary, elephant, “Oops!”  
*b*-aspect: Mary, elephant, “Oops!, narrow path”  
*a*: What has happened?  
*b*: Look, the path is narrow.
- $s_4$ . *a*-aspect: Mary, narrow path, “Oops!”  
*b*-aspect: Elephant, “Oops!”  
*a*: Mary is on the narrow path.  
*b*: She could have met the elephant.
- $s_5$ . *a*-aspect: Mary, elephant, narrow path, “Oops!”  
*b*-aspect: Mary.  
*a*: The elephant got scared by Mary’s cry.  
*b*: What has happened between Mary and him?  
*a*: The path is too narrow.

The success of a responsible communication in  $s_3 - s_5$  is achieved when the expressions are used that complete the agent’s perspective up to a full and exhausting representation of the state of affairs.

Is it always necessary to completely and fully represent the state of affairs?

**Scenario:** James Bond was sealed in the hold of the yacht where there were a lot of wool balls. As he was there, he knitted a new jacket with pencil. Now now he is released from captivity. On the island, the aborigines have made a bet on what captive was doing in the hold of the yacht. One of the Aborigines asks the people who surrounded Bond: What did the man or woman in the yacht do all this time?

- |   |            |
|---|------------|
| (1) Bond knitted a new jacket with a pencil.                        | full prop. |
| (2) Bond knitted a jacket with a pencil.                            | focus +    |
| (3) Bond knitted a jacket with something.                           | focus +    |
| (4) He knitted a jacket.  | focus +    |
| (5) Knitted something.  | focus +    |
| (6) Was knitting.   | focus      |
| (7) She knitted a pullover.   | spoiled    |
| (8) Kat knitted a blue pullover.                                    | spoiled    |
| (9) Radio assistant of Pronin knitted a blue pullover.              | spoiled    |
| (10) Radio assistant of Pronin knitted a blue pullover with a nail. | spoiled    |

Thematic focus – “to knit”.

All elements of periphery are **not locally compositional** and can be omitted – ellipsis.

Cutting an expression down to the information, which relates to the focus of communication, occurs due to entailment on the right upward monotonicity.

An inversion of the entailment isn't valid normally, but is possible by replacement of "usual" truth with "discursive" truth.

### Principle of peripheral interchangeability:

$A, B$  are of the same type  $\alpha$ ,  $A$  is component of  $D$ , and not in the focus of  $s_i$ .

$s_i: s_iSR(\alpha, D(\dots A \dots))s_k,$

$s_iSR(\alpha, D(\dots B \dots))s_m,$

$s_k, s_m \in S^*$ , i.e. the transformations  $\langle s_i, s_k \rangle, \langle s_i, s_m \rangle$  are successful, then:

$A$  and  $B$  are interchangeable in  $D$ .

If  $D$  has an ellipsis on  $A$ ,  $B$  can enrich it by emerging  $D^{SitExt}$ .

$s_i: A \approx B$

## Definition:

Component  $A$  of  $D$  belongs to the focus of the communicative situation  $s_i$  for  $a$ , if  $\mu(a, A) \neq \mu(a, B)$ , i. e.  $s_i SR(a, A) s_k$ ,  $s_i SR(a, B) s_m$ ,  $s_k \neq s_m$  and  $s_k \notin S^*$  or  $s_m \notin S^*$ .

## Degrees of local non-compositionality:

$\mu(e, a) \subseteq \mu(h, a)$  means, that degree of NC of  $e$  in  $s_i$  is lower,  
as a degree of NC of  $h$ .

## Relation between LNC and context dependences of meaning:

$A^{\wedge SP}$  takes the information of  $s_i$  and demand the external context information.

$(A^{SitExt})^{\wedge SP}$  takes only the information of  $s_i$ .

If announcing of  $A$  was successful in  $s_i$ , then  $A$  express the focus of  $A^{SitExt}$ .

Verbalization creates the periphery, ellipsis eliminates the periphery.

This kind of transformation is a condition under which we can know what compositionality and non-compositionality are.

But it is also a condition for the normal synthesis of language expressions.

## 5. Aspects of naming

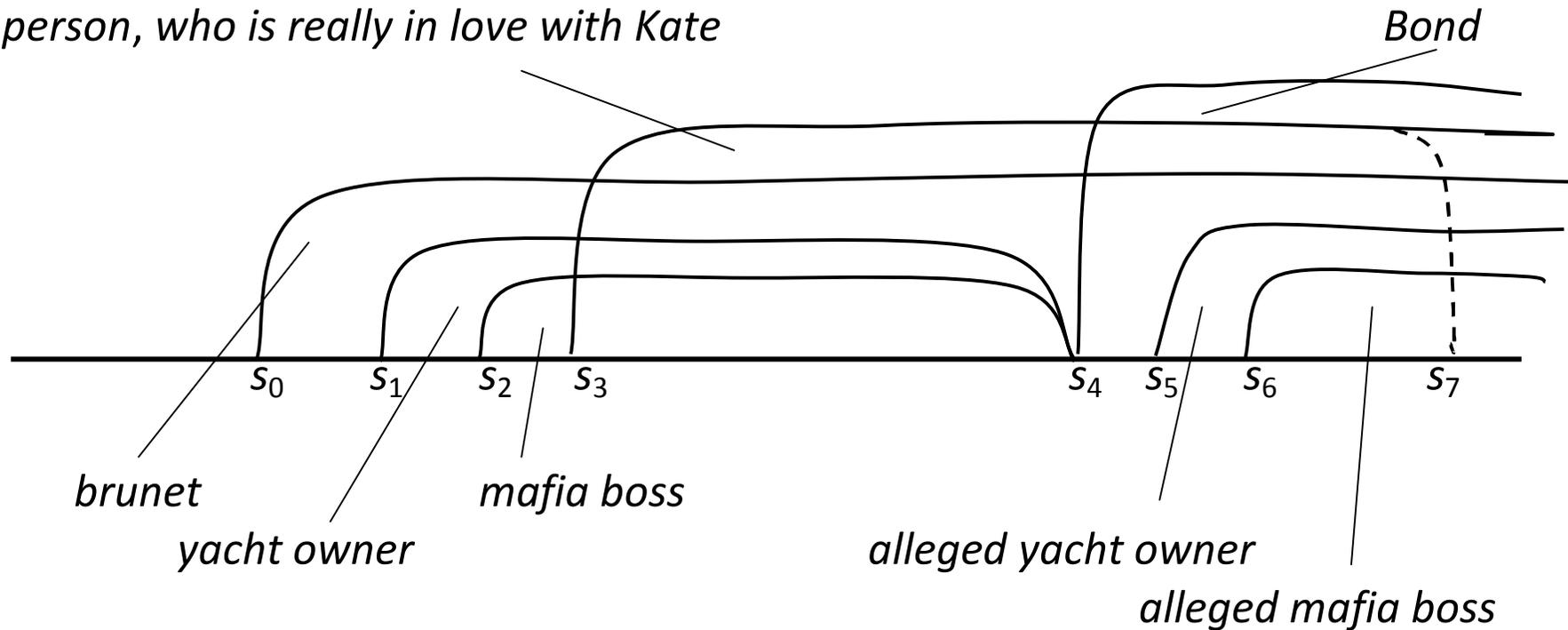
Scenario: James Bond pretends to be the owner of a yacht and to be a mafia boss, and he is (really) in love with Kate. Kate is a radio assistant of a soviet agent Pronin, who cannot recognize Bond, until a moment as he sees a film about Bond.

Pronin:

- $s_1$ : |The brunet|<sup>id</sup> is |yacht owner|<sup>descr</sup>  
 $s_2$ : |Yacht owner|<sup>id/descr</sup> is |the mafia boss|<sup>descr</sup>  
 $s_3$ : |Mafia boss|<sup>id/descr</sup> is |in love with Kat|<sup>descr</sup>  
 $s_4$ : Oh God! |He|<sup>id</sup> is |Bond|<sup>id/descr</sup>!  
 $s_5$ : |Bond|<sup>id</sup> is |an alleged yacht owner|<sup>descr</sup>  
 $s_6$ : |Bond|<sup>id</sup> is |an alleged mafia boss|<sup>descr</sup> too.  
 $s_7$ : Is |Bond|<sup>id</sup> |really in love with Kate|<sup>descr</sup>?

## Identifiers and descriptors:

*a person, who is really in love with Kate*

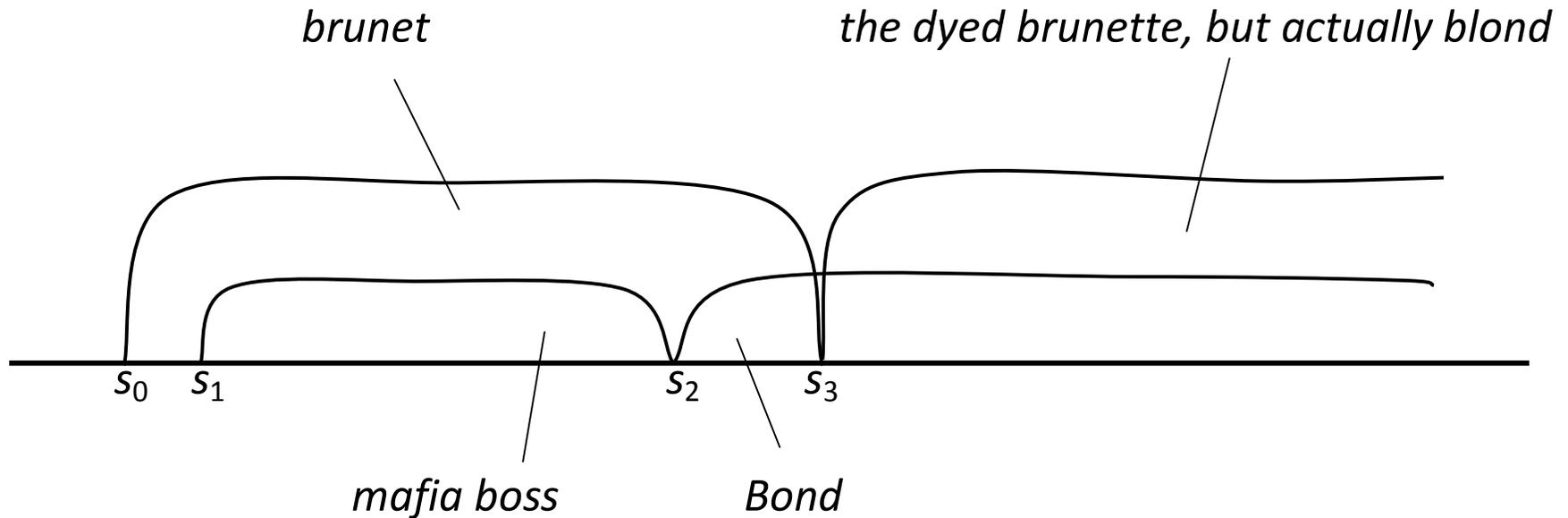


on the some interval  $s_i - s_k$   $\mu(\text{descriptor}, a) \subseteq \mu(\text{identifier}, a)$

$\mu(x, \text{Pronin}) \subseteq \mu(\text{"the brunet"}, \text{Pronin})$  for all  $s_i$ .

Compositionality rises (emerges) with the use of descriptors.

Как задать интервалы ситуаций, для которых не верно указанное отношение идентификатора и дескриптора?



on the interval  $s_0 - s_3$

$$\mu(\text{"mafia boss"}, \text{Pronin}) \subseteq \mu(\text{"the brunet"}, \text{Pronin})$$

$$\mu(\text{"Bond"}, \text{Pronin}) \subseteq \mu(\text{"the brunet"}, \text{Pronin}),$$

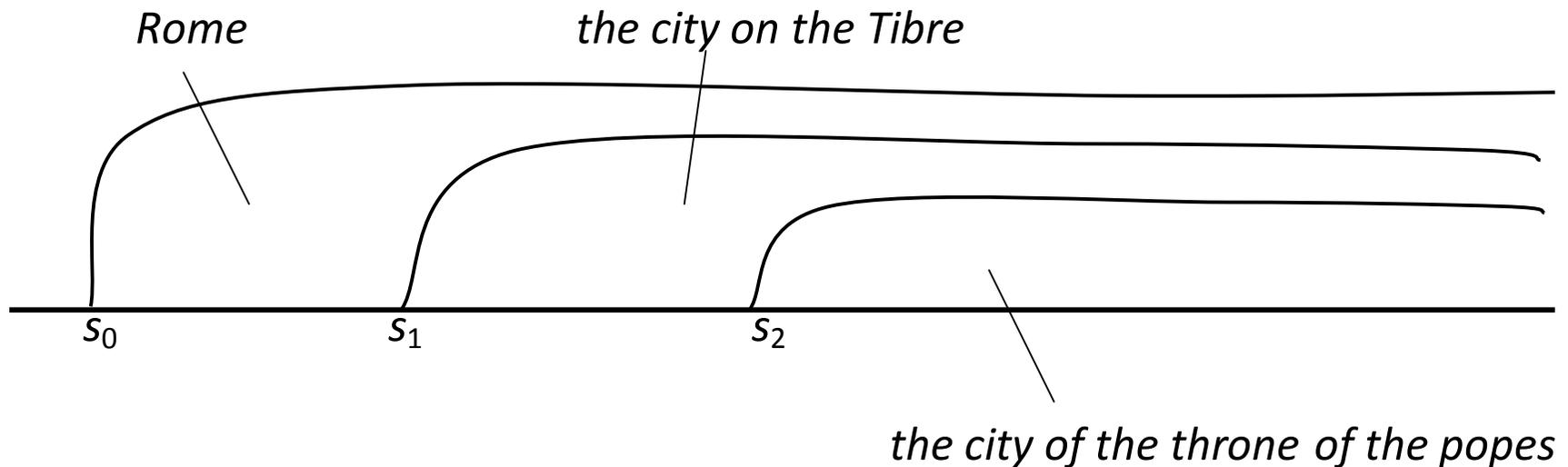
but after  $s_3$

$$\mu(\text{"dyed brunette, but actually blond"}, \text{Pronin}) \subseteq \mu(\text{"Bond"}, \text{Pronin}).$$

*Julius Caesar knew that |Rome|<sup>id</sup> | is situated on the Tibre|<sup>descr</sup>  
|Rome|<sup>id</sup> is |the city of the throne of the popes|<sup>descr</sup>*

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*Julius Caesar knew that |the city of the throne of the popes|<sup>id/descr</sup>  
is |situated on the Tibre|<sup>descr</sup>*



$\mu(\text{"the city of the throne of the popes"}, \text{J.C.}) = \emptyset,$   
then the expression can't be used relatively J.C.

## 6. Situation with two agent's perspectives: selection of the yellow objects.

There are yellow and green fruit and vegetables lying on the table. A customer needs random four yellow objects. She asks a shop assistant, who has “communicative” problems, to put something into her bag:

- (1) – *Give me, please, a yellow apple,* – asks a customer. The shop assistant puts on the counter *a yellow apple.*
- (2) – *Can I have now a yellow paprika,* – asks the customer. The shop assistant gives him a yellow melon.
- (3) – *Hum! ... the red onion, sorry, ...,* – he makes a slip of the tongue. The shop assistant gives him a yellow banana.
- (4) – *Oh! ..., you know, ...,* – he is at a loss. The shop assistant took out a yellow lemon.
- (5) – *Oh!, ..., and a yellow pumpkin, please,* – the customer ceases to understand, what is happening. The shop assistant took out a green cucumber.
- (6) – *No, no, a yellow pumpkin!* – The shop assistant says
- (7) – *Good afternoon!* – and disappears.

	Expectations of $a$	Factual meaning	Transformations
(1)	$\langle s_1, s_2 \rangle \in \varepsilon\mu(e_1, a), s_2ER(a)s_3$	$\langle s_1, s_2 \rangle \in \mu(e_1, a)$	$s_2Rs_3$
(2)	$\langle s_3, s_4 \rangle \in \varepsilon\mu(e_2, a), s_4ER(a)s_5$	$\langle s_3, s_4 \rangle \in \mu(e_2, a)$	$s_4Rs_6$
(3)	$\langle s_6, s_7 \rangle \in \varepsilon\mu(e_3, a), s_7ER(a)s_8$	$\langle s_6, s_7 \rangle \notin \mu(e_3, a),$ $\langle s_6, s_9 \rangle \in \mu(e_3, a),$	$s_9Rs_{10}$
(4)	$\langle s_{10}, s_{11} \rangle \in \varepsilon\mu(e_4, a), s_{11}ER(a)s_{12}$	$\langle s_{10}, s_{11} \rangle \notin \mu(e_4, a)$ $\langle s_{10}, s_{13} \rangle \in \mu(e_3, a),$	$s_{13}Rs_{14}$
(5)	$\langle s_{14}, s_{15} \rangle \in \varepsilon\mu(e_5, a), s_{15}ER(a)s_{16}$	$\langle s_{14}, s_{15} \rangle \in \mu(e_5, a)$	$s_{15}Rs_{17}$
(6)	$\langle s_{17}, s_{18} \rangle \in \varepsilon\mu(e_6, a), s_{18}ER(a)s_{19}$	$\langle s_{17}, s_{18} \rangle \in \mu(e_6, a)$	$s_{17}Rs_{20}$
(7)	$\langle s_{20}, s_{21} \rangle \in \varepsilon\mu(e_7, b), s_{21}ER(b)s_{22}$	$\langle s_{20}, s_{21} \rangle \in \mu(e_7, b)$	$s_{21}Rs_{22}$

$$s_5 \approx s_6$$

$$s_8 \approx s_{10}$$

$$s_{11} \approx s_{14}$$

$$s_{16} \not\approx s_{17}$$

$$NC^d(e_3) < NC^d(e_4),$$

## 7. Inference

A criterion of interchangeability is preservation of communicative success.

$\mu(e, a) \subseteq \mu(h, a)$   $e$  is more compositional, as  $h$

$\langle s_n, s_m \rangle \in \mu(e, a) \Leftrightarrow \langle s_n, s_m \rangle \in \varepsilon\mu(e, a)$  transparency

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$\mu(d( \dots e \dots ), a) \subseteq \mu(d( \dots e/h \dots ), a)$  down monotonicity

As semantic conditions it entails

$C \rightarrow (g( \dots e \dots ) \rightarrow g( \dots e/h \dots ))$ , where  $C$  expresses the context information

## Conclusions

- LC emerges through the performing of pragmatic procedures.
- There is a scale of compositionality degrees between total compositionality and LC.
- Compositionality and non-compositionality are empirical features of meaning (not of sense aspect) in the situation. They have a causal relationship with the variety of communicative situations.
- The probability of success can depend on the reactions of the other agent, which outruns the work on expanding the language.
- In fact compositionality exists always to some extent with non-compositionality.

**THANK YOU FOR YOUR ATTENTION!**