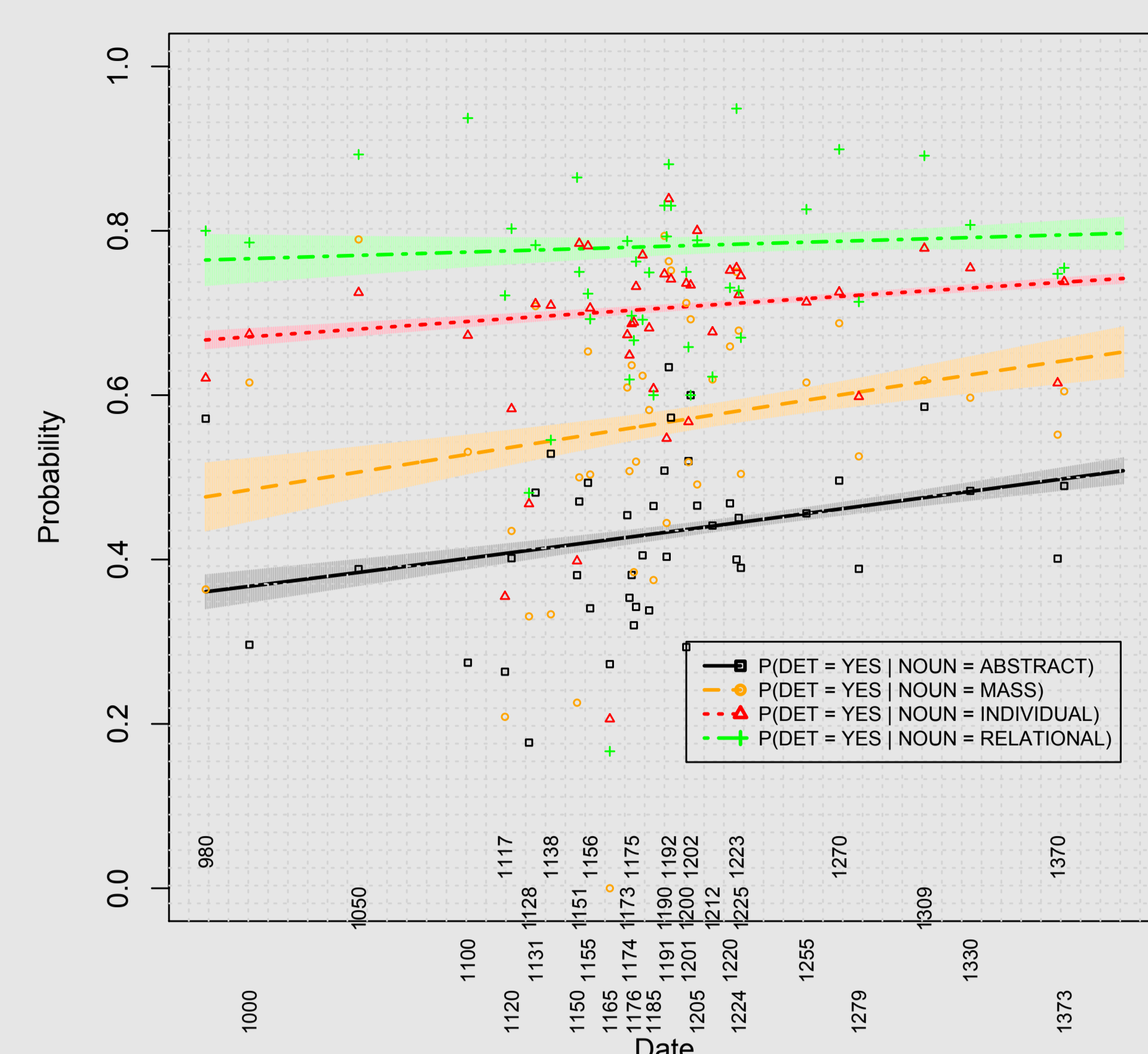


BACKGROUND

- le/la/les rates increase in historical French from 1000 to 1400 (based on Kroch and Santorini 2010).



- Simonenko and Carlier (2020): demonstrative- vs. definite grammar competition for le/la/les; the definite grammar is winning and the le/la/les frequency is rising since definites have more contexts of obligatory use.
- But WHY? There must have been a **disturbing** factor creating a pragmatic advantage for the definite grammar.

EXISTENTIAL PRESUPPOSITION (GIVENNESS) MARKING

- Definites introduce an existential presupposition (Strawsonian tradition).
- Movement can do it, too:
  - fronting (Molnárfi 2004 for Mod. German)
  - OV vs. VO (Struik and Van Kemenade 2018 for hist. English)
  - scrambling (Skopeteas and Fanselow 2009, typological)

GIVEN > NEW

Why movement (and not just base order)?

To align constituents with [Given > New] information flow (Skopeteas and Fanselow 2009).

- Generalization \*New > Given**  
Within a domain  $[Dom Y \dots X]$ , if X is given, so is Y. Kučerová (2012)

- Chlapec našel lízátko.  
boy.Nom found lollipop.Acc  
"The/a boy found a lollipop." # 'A boy found the lollipop.' Czech

Fronting allows for S:new O:given interpretation:

- Lízátko našel chlapec.  
lollipop.Acc found boy.Nom  
"A boy found the lollipop." Czech

A determiner obviates \*New > Given:

- Chlapec našel ten lízátko.  
boy.Nom found this lollipop.Acc  
"A boy found this lollipop."

HYPOTHESIS

- Decline of movement operations is the disturbing factor for the definite vs. demonstrative grammar equilibrium.
- As the fronting/scrambling declines in a language (for whatever reason...), the use of the definite grammar gains grounds.

HISTORICAL FRENCH CONVERGES ON SO

	OS	SO
1100	0.17	0.83
1200	0.18	0.82
1300	0.07	0.93
1400	0.06	0.94

QUESTION

- How do the changes in the frequency of O-over-S movement affect the frequency of determiner use by the speakers?

RATIONAL SPEECH ACT MODEL (FRANK AND GOODMAN 2012)

- Speaker = probability distribution over utterances.
- Listener = probability distribution over information states.

A Pragmatic Speaker, when assigning probs to utterances  $u_1 \dots u_n$  to convey an information state  $s_i$ , takes into account how **likely** the Listener is to get  $s_i$  upon hearing a given  $u_j$ , and how **costly**  $u_j$  is.

$$(5) U_S(u_j; s_i) = \log L(s_i | u_j) - C(u_j) \quad \text{Scontras et al. (2017)}$$

MOVEMENT/DETERMINER TRADEOFF

INFORMATION STATES (LITERAL MEANING)

- "SO"  $\{[S:\text{Giv O}:\text{New}], [S:\text{Giv O}:\text{Giv}], [S:\text{New O}:\text{New}], [S:\text{New O}:\text{Giv}]\}$
- "OS"  $\{[S:\text{Giv O}:\text{New}], [S:\text{Giv O}:\text{Giv}], [S:\text{New O}:\text{New}], [S:\text{New O}:\text{Giv}]\}$
- "SdetO"  $\{[S:\text{Giv O}:\text{New}], [S:\text{Giv O}:\text{Giv}], [S:\text{New O}:\text{New}], [S:\text{New O}:\text{Giv}]\}$

Table: Simplified utterance inventory

(LITERAL) LISTENER upon hearing "SO":

input	output
a) literal meaning of "SO"	
b) prior probs of states	
$P(S:\text{Giv O}:\text{New}) = 0.25$	$P(S:\text{Giv O}:\text{New}) = 0.33$
$P(S:\text{Giv O}:\text{Giv}) = 0.25$	$P(S:\text{Giv O}:\text{Giv}) = 0.33$
$P(S:\text{New S}:\text{New}) = 0.25$	$P(S:\text{New S}:\text{New}) = 0.33$
$P(S:\text{New O}:\text{Giv}) = 0.25$	$P(S:\text{New O}:\text{Giv}) = 0$

(LITERAL) LISTENER upon hearing fronted/scrambled "OS":

input	output
a) literal meaning of "OS"	
b) prior probs of states	
$P(S:\text{Giv O}:\text{New}) = 0.25$	$P(S:\text{Giv O}:\text{New}) = 0$
$P(S:\text{Giv O}:\text{Giv}) = 0.25$	$P(S:\text{Giv O}:\text{Giv}) = 0.33$
$P(S:\text{New S}:\text{New}) = 0.25$	$P(S:\text{New S}:\text{New}) = 0.33$
$P(S:\text{New O}:\text{Giv}) = 0.25$	$P(S:\text{New O}:\text{Giv}) = 0.33$

(LITERAL) LISTENER upon hearing "SdetO":

input	output
a) literal meaning of "SdetO"	
b) prior probs of states	
$P(S:\text{Giv O}:\text{New}) = 0.25$	$P(S:\text{Giv O}:\text{New}) = 0$
$P(S:\text{Giv O}:\text{Giv}) = 0.25$	$P(S:\text{Giv O}:\text{Giv}) = 0.5$
$P(S:\text{New S}:\text{New}) = 0.25$	$P(S:\text{New O}:\text{New}) = 0$
$P(S:\text{New O}:\text{Giv}) = 0.25$	$P(S:\text{New O}:\text{Giv}) = 0.5$

(PRAGMATIC) SPEAKER who wants to express [S:new O:Giv]:

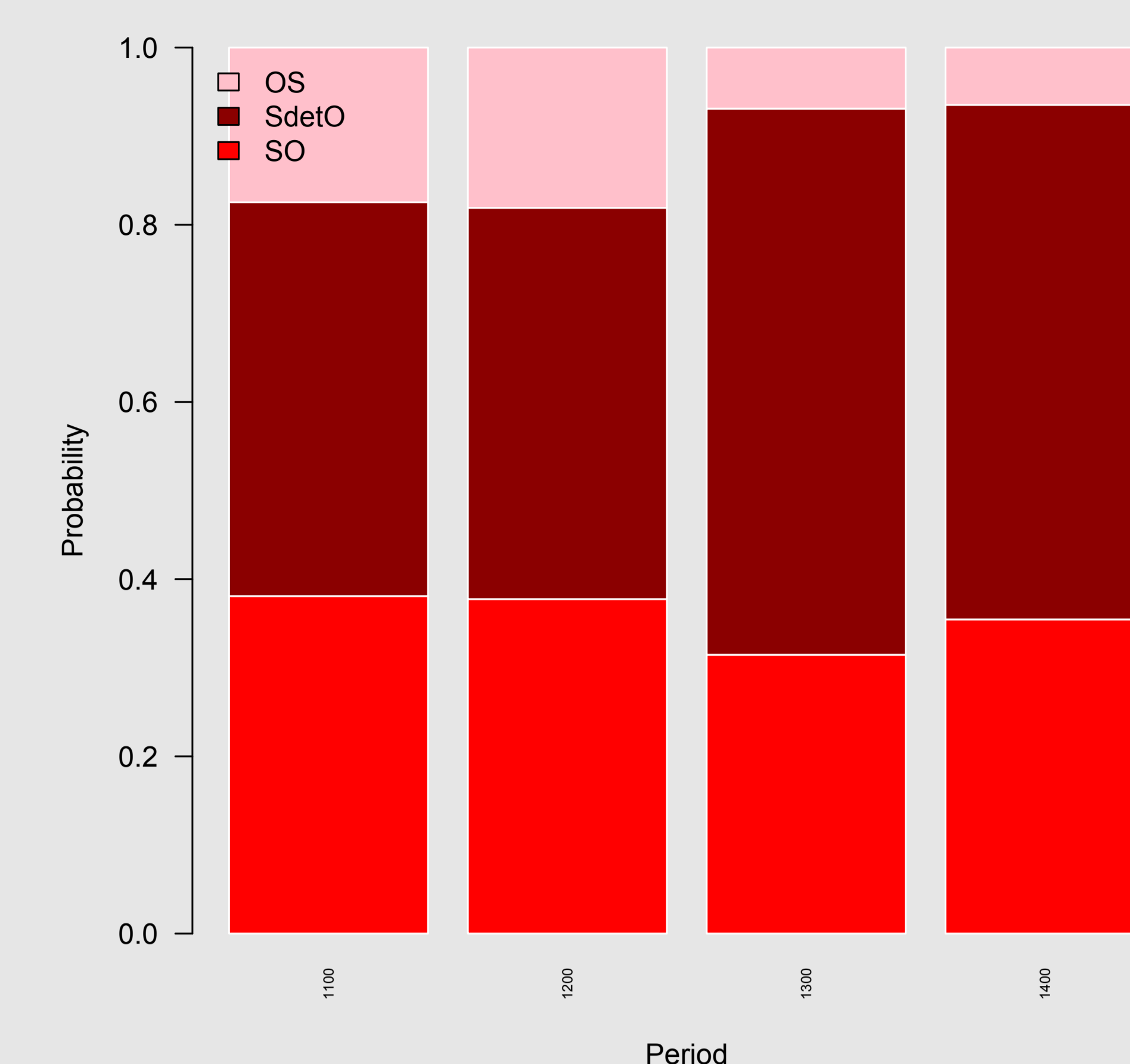
input	output
a) model of the Literal Listener	
b) prior probs of utterances	
$P("SO") = 0.33$	$P("SO") = 0$
$P("OS") = 0.33$	$P("OS") = 0.4$
$P("SdetO") = 0.33$	$P("SdetO") = 0.6$

ASSUMPTIONS

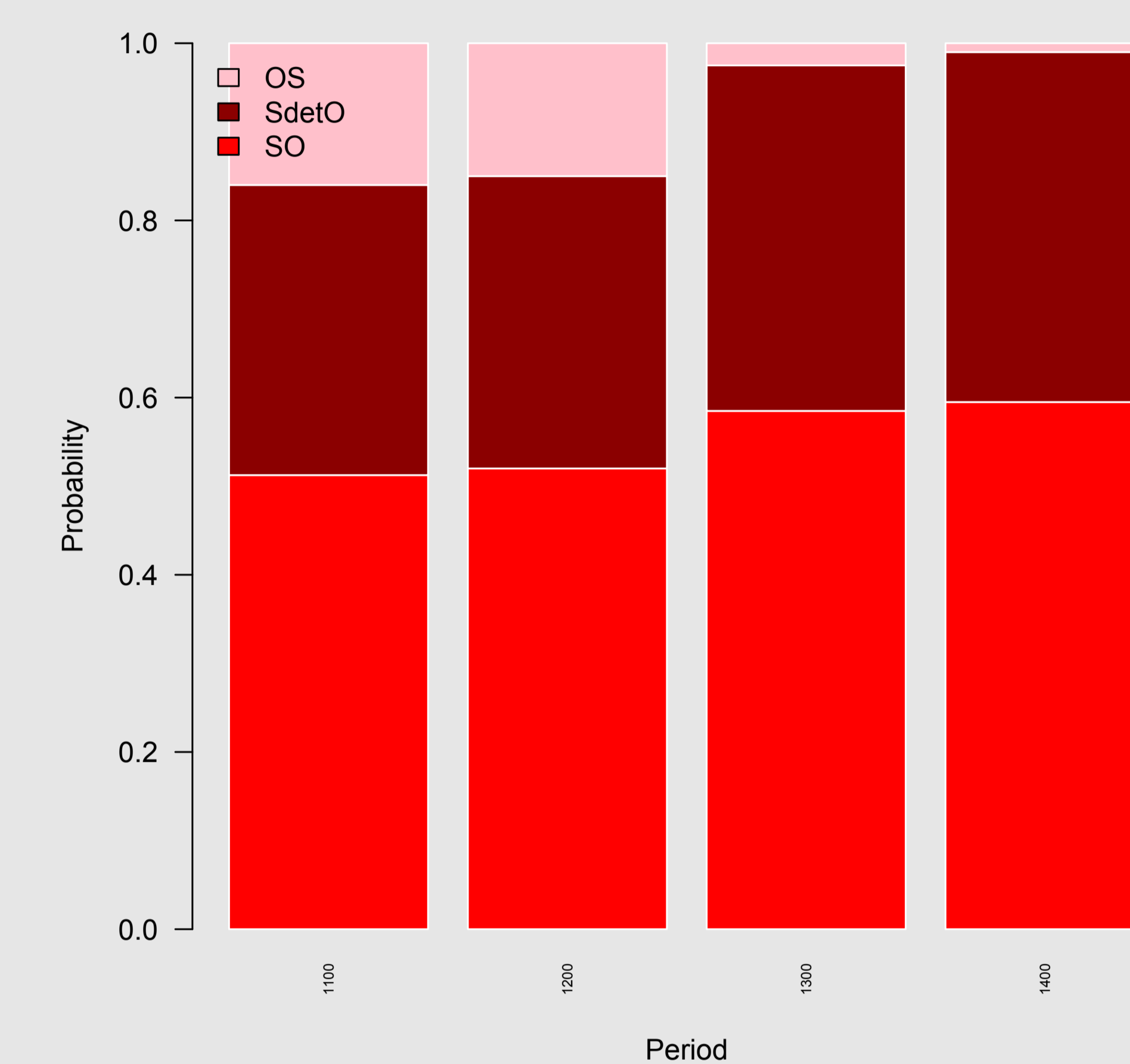
- The cost of movement (OS) rises with time;
- "SO" cannot express [S:New O:Giv];
- "OS" cannot express [S:Giv O:New].

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 Skopeteas, Stavros, and Gisbert Fanselow. 2009. Effects of givenness and constraints on free word order. In *Information structure: Theoretical, typological, and experimental perspectives*.  
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RESULTS: HISTORICAL FRENCH

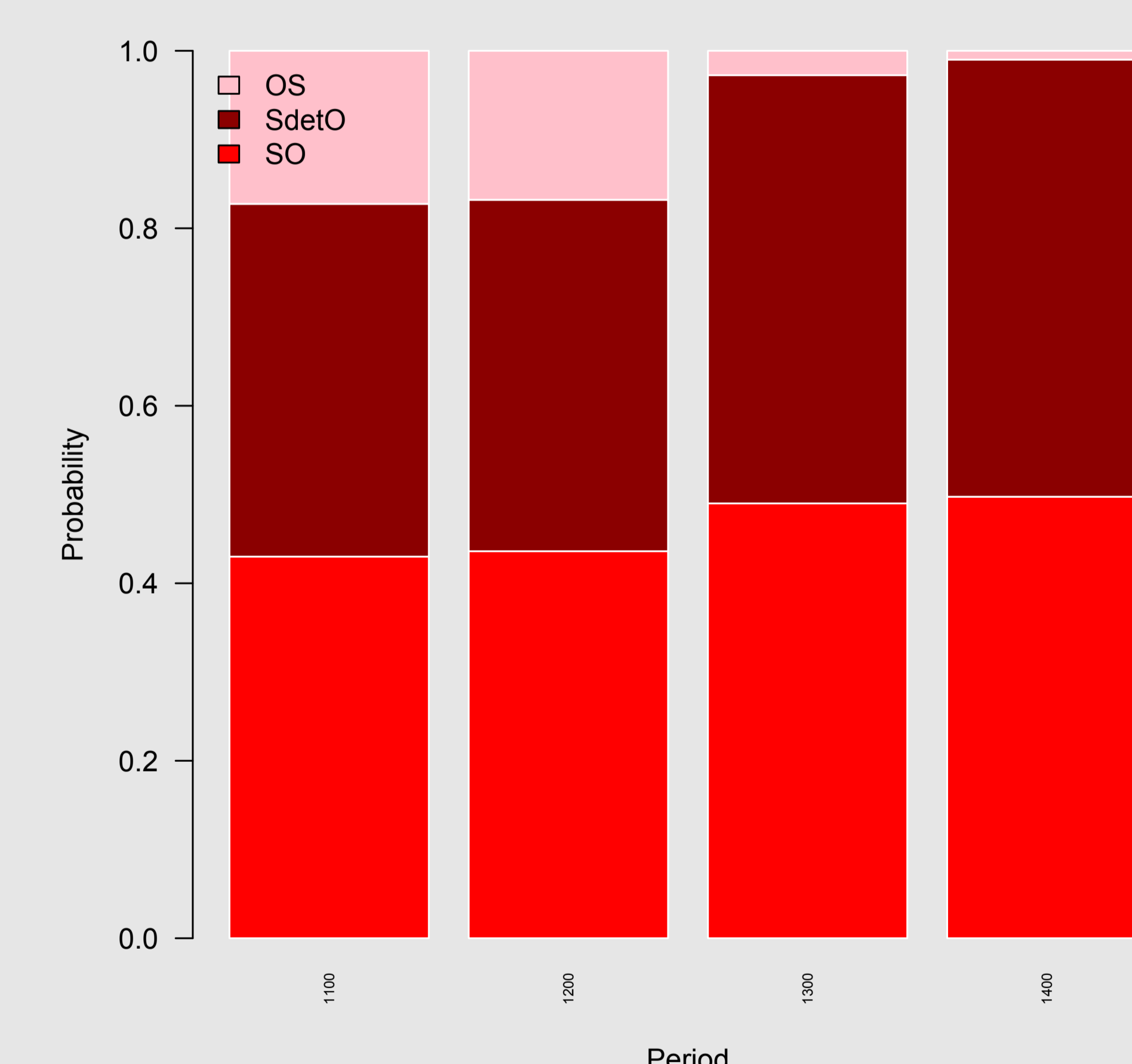


RESULTS: GAME-THEORETIC PRAGMATIC SPEAKER



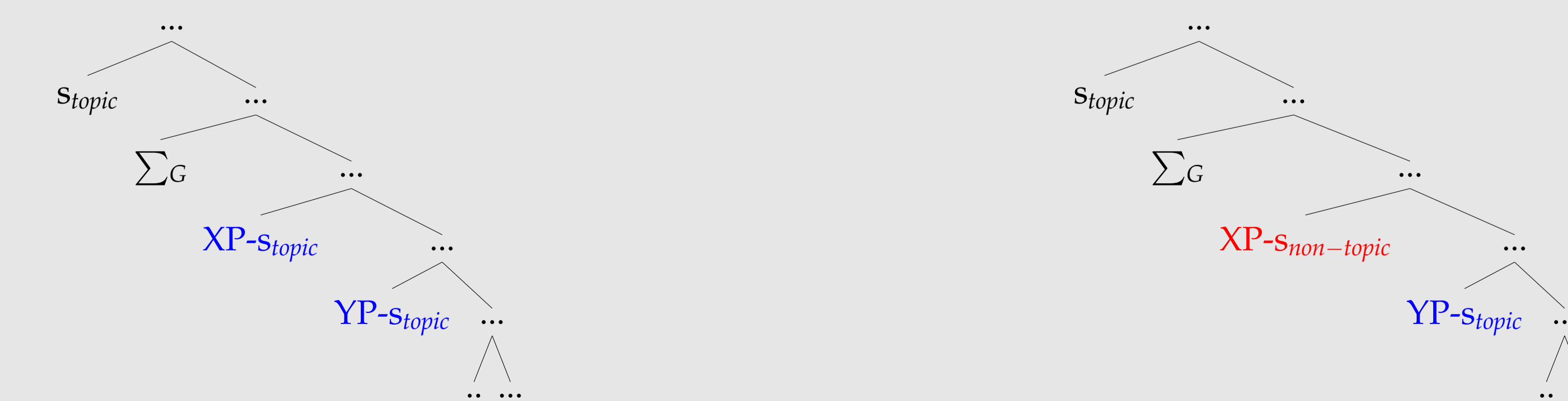
RESULTS: GAME-THEORETIC PRAGMATIC SPEAKER WITH MAXIMIZE PRESUP.

- SO is penalized on [S:Giv O:Giv] interpretation because of Heim's Maximize Presupposition! pressure to use definite determiners whenever felicitous.



Addendum: Amendment to Kučerová (2012)

- Givenness operator is a situation binder  $\sum_G$ , which binds all (unbound) situation variables, down to a point where there is another binder, to a **topic situation**.
- Givenness is an inference that the extensions of predicates interpreted relative to a topic situation are non-empty.



- stopic – topic situation pronoun;  $\sum_G$  – situation binder; -s – situation argument of a nominal predicate