

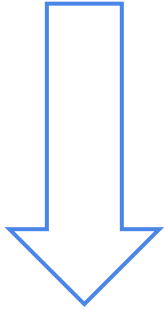
High level reading processing



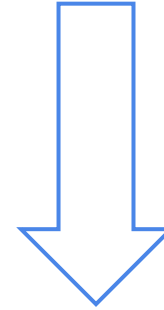
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Studies

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Project 1. Ambiguity Resolution



Structural (syntactic)



Referential

Structural (syntactic) ambiguity

- **Modifier attachment ambiguity in complex noun phrases**

(1) *the servant of the actress... that was on the balcony*

N1

N2

standing on the balcony

HA

LA

with red hair

How are they processed on-line?

- Are globally ambiguous sentences processed differently in comparison to unambiguous?
- Are temporally ambiguous sentences processed differently depending on the meaning towards which ambiguity was resolved?

Structural (syntactic) ambiguity

- Russian: ambiguity resolution by means of morphology

(2a) Ambiguous attachment (condition AMB):

Svidetel' upomjanul naparnika voditelja, včera videvšego eto ograblenie.

Regions:

N1 N2 mod part post1 post1

witness mentioned workmate**ACC** driver**GEN** yesterday having-seen**ACC=GEN** this robbery

(2b) Low attachment (condition LA):

Svidetel' upomjanul o naparnike voditelja, včera videvšego eto ograblenie.

witness mentioned about workmate**PREP** driver**GEN** yesterday having-seen**GEN** this robbery

(2c) High attachment (condition HA):

Svidetel' upomjanul o naparnike voditelja, včera videvšem eto ograblenie.

witness mentioned about workmate**PREP** driver**GEN** yesterday having-seen**PREP** this robbery

(2d) Question (in translation): *Who saw the robbery?*

Experiment

Material:

- 24 sets of target stimuli and 50 fillers.
- Target stimuli: complex NP + participial construction in three conditions
- Every participant saw each target sentence once, in one of the conditions. All sentences were followed by a question

Свидетель упомянул о напарнике водителя, вчера видевшем это
ограбление.



Results

- **First run PART region:** HA >LA: $F=3.634$, $p=0.042$
- **Total dwell time:** No differences PART region across conditions.
- **Regressions**
 - **to PART region:** LA >HA ($\chi^2=4.29$, $p=0.04$) and AMB>HA ($\chi^2 =12.95$, $p=0.0003$)
 - **from PART region:** in LA >HA ($\chi^2 =3.94$, $p=0.05$)
 - **to NPs:** NP1 is reread twice more often than NP2 ($\chi^2= 187.76$, $p<0.001$)

- **Offline data of answer analyses**

Ambiguous sentences interpreted as HA in 64.6%

in HA condition: 75.6% correct answers

in LA condition: 38.6% correct answers (!)

- High attachment preference

Discussion

- Early effects show that high attachment requires more time to process than low or ambiguous attachment - as Late Closure principle predicts.
- Late effects show that adjunct attachment to a more discourse prominent NP (i.e. the head of the complex NP) is more preferable, which corresponds to offline data

Referential ambiguity

- Referentially ambiguous and unambiguous texts, consisting of two sentences:

(a) **Izvestn-yj pisatel** vse čaše radovalsa **za edinstvenn-ogo syn-a**. Nakonec **on počuvstvoval uverenost v zavtrašnem dne**.

Famous-NOM writer-NOM increasingly rejoiced **at his single-ACC son-ACC**. Finally **he felt confident about the future**.

- **Cognitive processing during reading ambiguous vs unambiguous sentences**

(b) **Izvestn-yj pisatel** vse čaše radovalsa za edinstvenn-uyu doč. Nakonec **on počuvstvoval uverenost v zavtrašnem dne**.

Famous-NOM writer-NOM rejoiced at his **single-ACC daughter-ACC**. Finally **he felt confident about the future**.

Referential ambiguity

Factors that influence ambiguous pronoun resolution: syntactic structure vs information structure

Izvestn-yj pisatel vse čaše radovalsa **za edinstvenn-ogo syn-a**. Nakonec **on počuvstvoval uverenost v zavtrašnem dne**.

Famous-NOM writer-NOM increasingly rejoiced **at his single-ACC son-ACC**. Finally **he felt confident about the future**. SVO

Izvestn-ogo pisatel-a vse čaše radoval **edinstvenn-yj syn**. Nakonec **on počuvstvoval uverenost v zavtrašnem dne**.

Famous-ACC writer-ACC increasingly rejoiced **his single-NOM son-NOM**. Finally **he felt confident about the future**. OVS

Experiment

Material:

- 18 sets of target stimuli and 50 fillers.
- Every participant saw each target sentence once, in one of the conditions.
- All sentences were followed by a question

Известный писатель все чаще радовался за единственного сына.

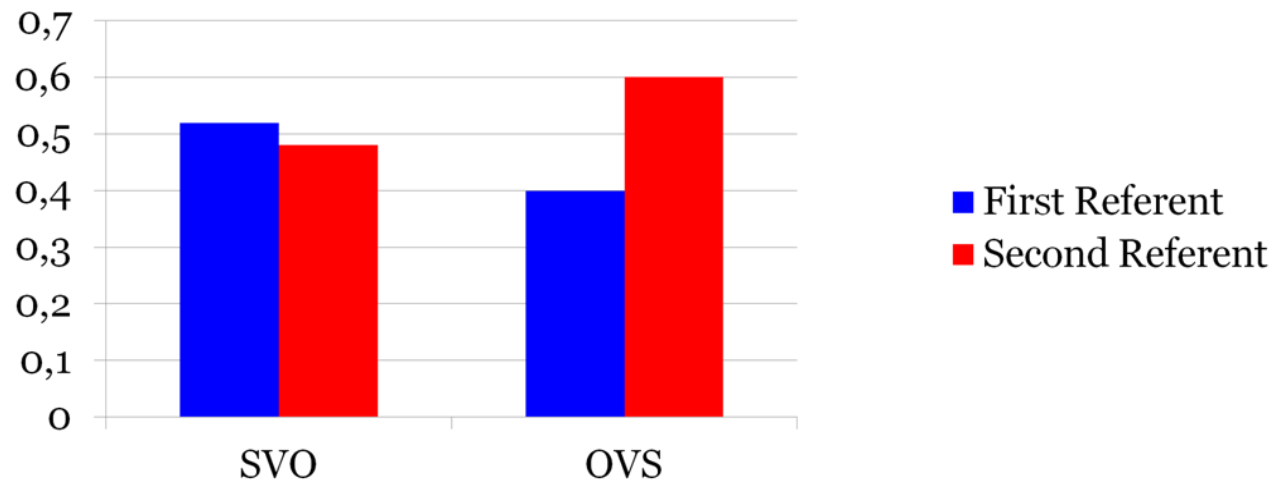
Наконец он почувствовал уверенность в завтрашнем дне.



Results

- **AMB vs UNAMB**
 - First-pass: no differences
 - Second pass: $AMB < UNAMB$, $F(1,34) = 6.260$, $p = 0.017$
- **SVO vs OVS**
 - Regressions INTO: 1st referent $>$ 2nd referent, $F1(1,33) = 202.085$, $p < 0.001$; $F2(1,17) = 46.494$, $p < 0.001$
 - Run Count: 1st referent $>$ 2nd referent, $F1(1,33) = 29.876$, $p < 0.001$; $F2(1,17) = 12.120$, $p = 0.003$
 - No reliable effect of Referent Syntactic Position was found ($F < 1$).

- **Offline data of answer analyses**



Discussion

- The ambiguity advantage in reading times is consistent with previous researches by Swets et al. (2008).
- The robust primacy effect in sentence processing was found: first-mentioned participants form the foundation for sentence-level representations (see Gernsbacher & Hargreaves, 1988). However, this effect does not provide any advantage to the first referent in pronoun resolution.
- The answers showed that pronoun interpretation is driven by information-structural factors: pronouns tend to refer to the referent that is in focus position, i.e. the focus of previous sentence becomes a topic of the next one (linear thematic progression).

Project 2. Translation quality assessment

- Place and role of the assessment expert in the reading paradigm along with the native reader and the translator.

Experiment

Material:

- 12 segments of an article translated by a student translator.
- Participants were presented with an original segment, a translated segment and then both.
- They were then told to assess a segment on a scale from 1 to 5.
- Control group: native speakers of Russian just reading in English

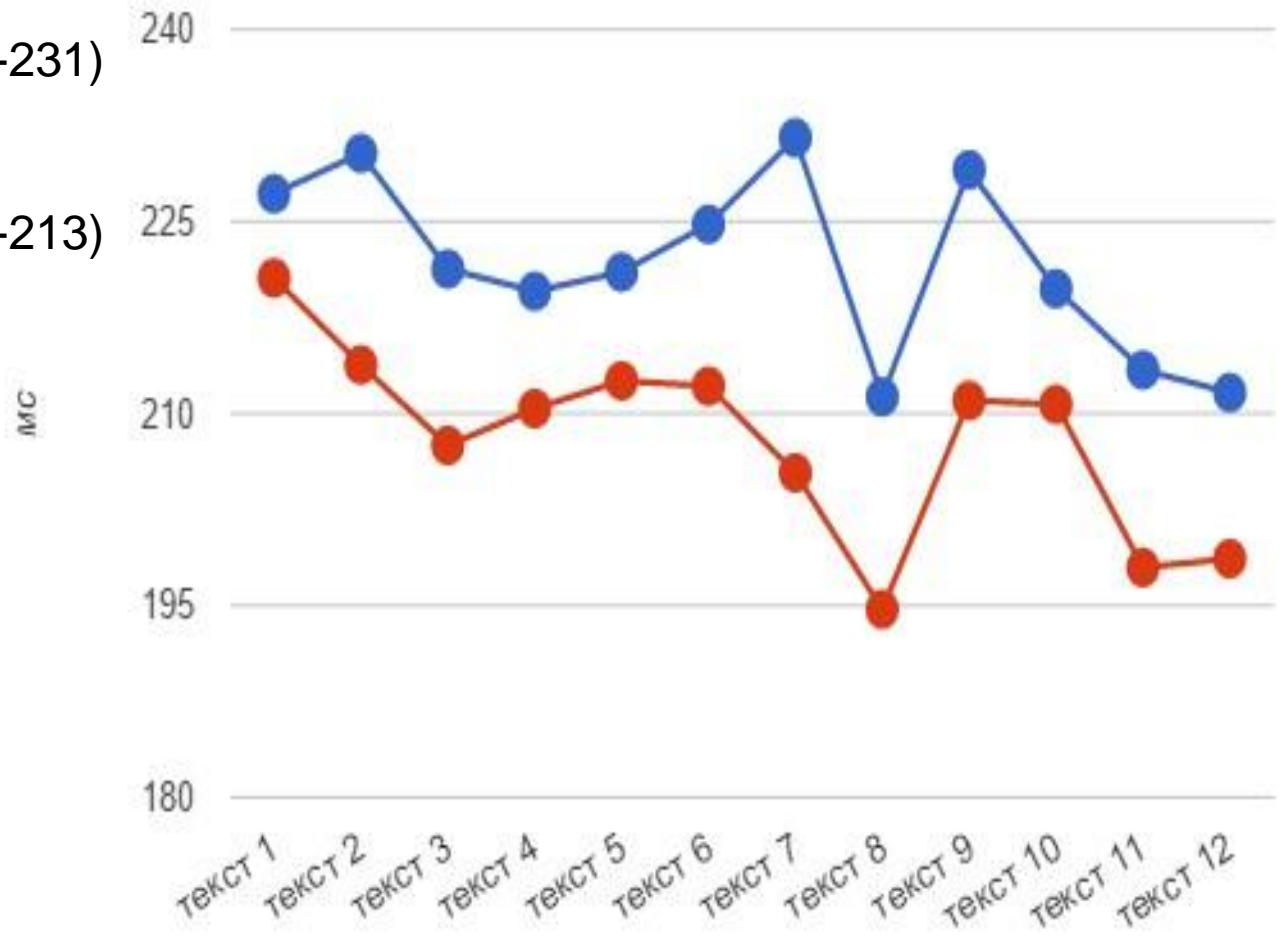
Results

Translators (235-259)

Experts (212-231)

Native speakers (195-213)

Mean fixation duration



One-way ANOVA

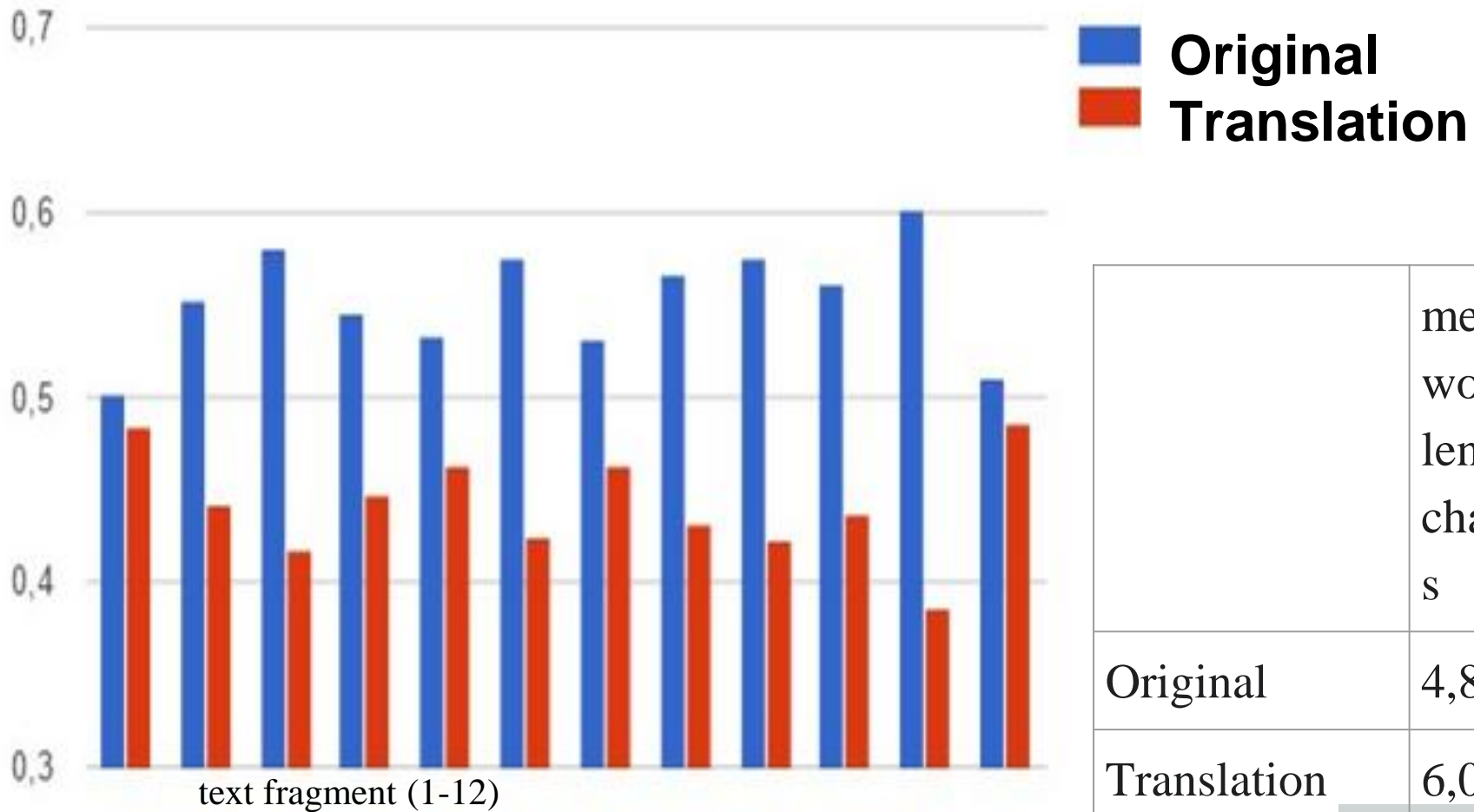
$F=21,334$

$p<0.001$

Results

One-way ANOVA: $F=85,842$, $p<0,001$

Dwell time in %



	mean word length in characters
Original	4,8
Translation	<u>6,06</u>

Discussion

- Experts while reading indicate more cognitive load than native speakers.
- During assessment experts tend to pay more attention to the original of the text and not the translation. Possibly because assessment of equivalence needs more effort than assessment of adequacy.



The British food industry relies excessively on trust and paper-based reassurance about food content, as opposed to random testing at every stage of the food chain, the environment secretary, Owen Paterson, has admitted. Giving a Commons statement on the escalating horsemeat scandal, Paterson said he wanted to see random testing introduced as quickly as possible. "There is too much faith in the paper which records what is the consignment. I would very much like to see more random testing of products as they arrive and are half way through the process. It is a very important point," he said.

Секретарь по вопросам охраны окружающей среды Сьюэл Патерсон признает, что пищевая промышленность в Великобритании больше, чем следует, полагается на доверие к производителям продуктов питания и закрепленное лишь в документах описание состава пищи, но не на произвольную проверку на любом этапе процесса изготовления пищевых продуктов. Высказывая от лица Палаты Общин мнение о набирающем обороты мясном скандале, Паттерсон высказал свое пожелание о скорейшем введении подобного вида проверки. Он, в частности, сказал: «Доверие к информации, содержащейся в накладных на товар, слишком велико. Я бы хотел, чтобы проводилось больше произвольных проверок продуктов по мере их поступления, а также в середине процесса их переработки. Это весьма и весьма важный момент».

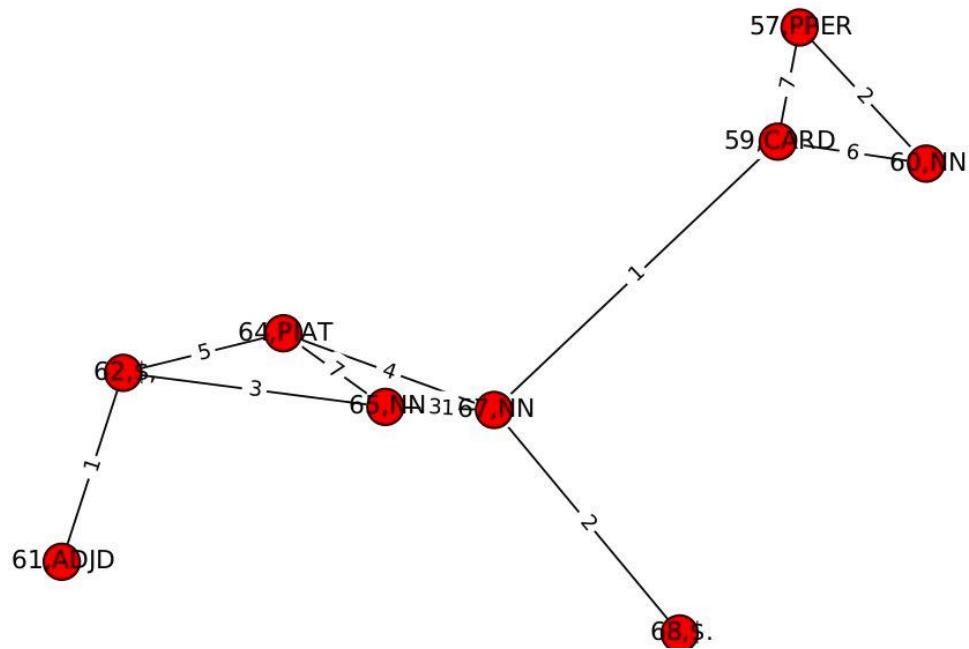
Perspectives

- cyrillic letters similarity matrix
- sentence and text studies
- syntactic structures analysis

Acknowledgements



Veronica
Prokopenya



Daria
Chernova