

Why do we overspecify in dialogue?

An experiment on L2 language acquisition

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We describe an **experimental study** designed to evaluate the effect of overspecification on L2 language acquisition. Our **hypothesis** is that overspecification helps establish alignment, which facilitates the acquisition of lexemes. Our **results** show that subjects receiving overspecified references during the exercise phase are slower at resolving the exercises, but have better lexeme acquisition rates. This supports the claim that overspecification is a useful mechanism for communication.

There are two main competing explanations that have been proposed for the **overspecification phenomenon**:

1. overspecification is a result of speakers' cognitive limitations and impairs the comprehension of the referring expressions (Engelhardt et al., 2011),
2. overspecification is a useful part of communication because it gives the listener more chances to align with the speaker, compensates for perceptual difficulties, and makes future communication more effective (Nadig & Sedivy, 2002).

We aim to support explanation (2) by empirically evaluating the effect of overspecification on lexical acquisition in second language (L2) learning.

Hypothesis: overspecification helps establish alignment (Brennan & Clark, 1996) between the speaker and the listener, which in turn facilitates lexical acquisition.

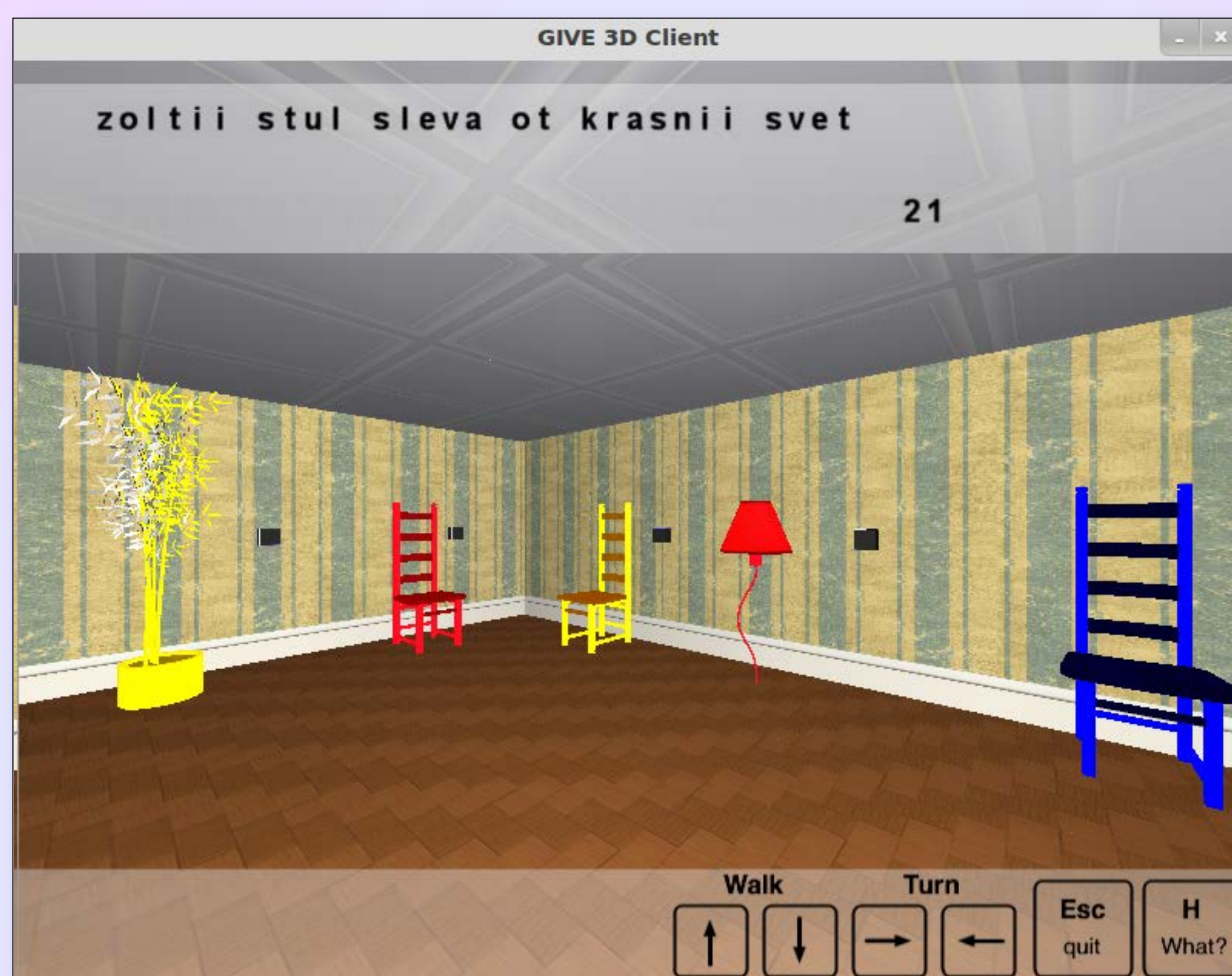


Experiment

- 50 subjects
- 2 equal groups: the **MR** (Minimal Reference) group received minimal referring expressions whereas the **OR** (Overspecified Reference) group received overspecified referring expressions

Using the **GIVE platform**
(Koller et al., 2008)

“zoltii stol sleva ot krasnii svet”
means
“yellow chair on the left of the red light”



We created an instruction-giving system that produces minimal and overspecified referring expressions of objects

- 3 phases:
- exercise phase
 - 1st test phase
 - 2nd test phase

Results

We extracted information on whether and how much the number of errors decreased between the First Test Phase and the Second Test Phase

Metric	MR	OR
Lexeme acquisition rate (%)	56	89
Error overcoming (%)	29	43
Resolution speed (cm/s) ^a	101.1	49.88

a. The metric unit used for speed is an interpretation of perceived size in the virtual world

We can see that 33% more OR subjects decreased their errors compared to MR subjects, which is represented by the **lexeme acquisition rate**, and that a bigger percentage of errors was overcome in the OR condition (43%) than in the MR condition (29%) (the **error overcoming rate**).

We can also see that the **average resolution speed** with which the subjects in each condition resolved the referring expressions in the exercise phase is two times slower for the OR condition than the MR conditions.

Post-experiment questionnaire

We found that OR subjects did not rate the received expressions worse and evaluated that the Exercise Phase as more useful to acquire the lexemes than the subjects in the MR condition.

Our hypothesis is confirmed by our results:

1. the overall OR lexeme acquisition rate was significantly higher than that of the MR condition,
2. subjects perceived the training exercises as more effective when overspecified referring expressions were used.

These results are coherent with previous work that reports that it takes more time to resolve overspecified referring expressions and that overspecified referring expressions are evaluated as equal to minimal ones (Engelhardt et al., 2006).

We have shown that subjects learning Russian words via a virtual-world task had better success rates when they were provided with overspecified training exercises, and evaluated the exercises as more useful. This has applications in dialogue system development: if overspecification is useful for establishing alignment, then algorithms should produce overspecified references to facilitate communication.