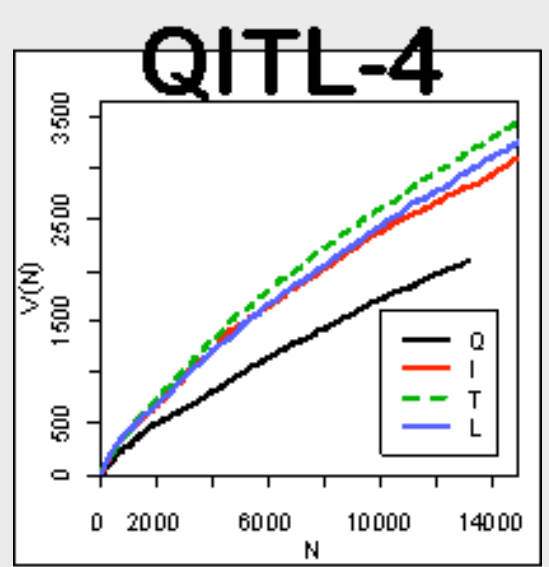


# Developing productivity with a new construction

## Are there frequency effects in instructed second language acquisition?



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### (1) Productivity & Frequency Effects in Instructed Second Language Acquisition (SLA)

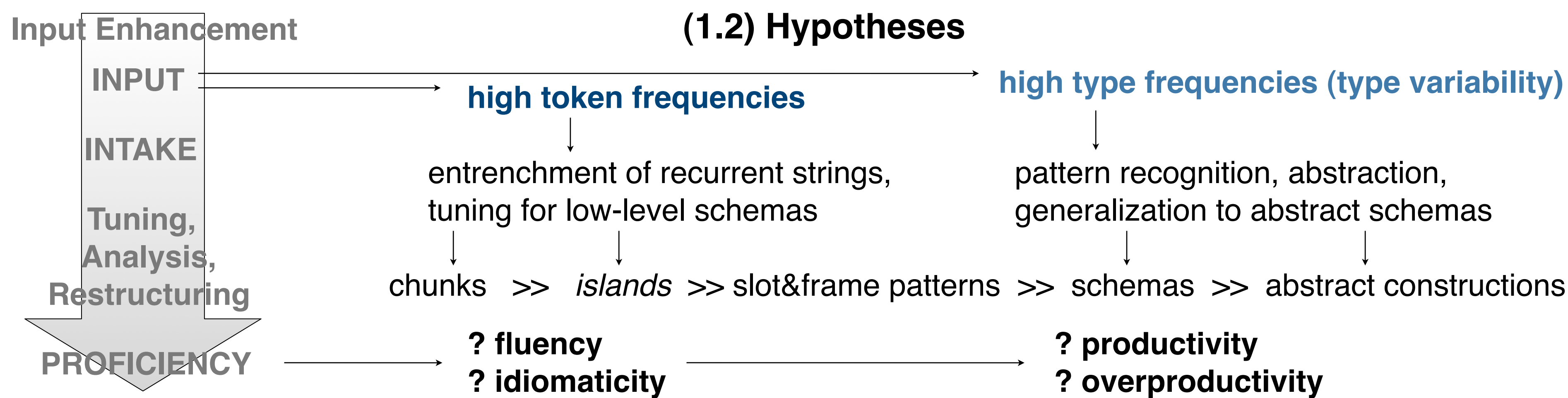
#### (1.1) Background

Usage-based models of language show that for first languages, **implicit learning** via mostly unconscious domain-general processes like entrenchment, distributional tallying of form-function mappings, schematization and categorization from the input is crucial for processing, storing and acquisition (Tomasello 2003). This assumption **predicts significant effects for input features like type-token frequency distributions** on all aspects of processing, storage and acquisition (Diessel 2007). The development of productivity in first language acquisition and artificial language learning seems to be specifically dependent on input features such as overall type variability and skewed input (Boyd/Goldberg 2009, Goldberg/Casenhiser 2008, Suttle/Goldberg to app.). However, the question whether the development of **productivity** in instructed SLA is bound to the same mechanisms and frequency effects is only beginning to be seriously investigated (Ellis/Ferreira-Junior 2009, Year/Gordon 2009, McDonough/Kim 2009). It is a highly important one, though, with respect to instruction, i.e. **improved input structuring for optimal input processing**.

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#### (1.2) Hypotheses



#### (1.3) Research Questions

- (1) How do adult second language learners attain productivity with a new schematic construction?
- (2) Which effects do various type and token frequency distributions have in this domain? Are there any frequency effects at all in authentic SLA contexts with adult learners?
- (3) How can developing (over-) productivity be detected, tracked and quantified in learner data?

### (2) Pilot Study: Effects of Overall Type Frequency (Type Variability/Type-Token Ratio) on Productivity

#### (2.1) Test Design

- Target construction: *sein* + present participle (e.g. *das war faszinierend, das ist total frustrierend, das ist ja entzückend*...)
- Training input: 9 min. of structured, enhanced audio input on each training day (days 2-4)
- Quantitative data: pretest, day 1; posttest, day 5
- Qualitative data: daily written tasks (in class); learner diaries (homework)

#### (2.2) Conditions & Groups

test condition 1: high type frequency 45 tokens, 30 types 1-2 tokens per type	group 1: level B.1, n=4 group 2: level B.2, n=4
test condition 2: low type frequency 45 tokens, 7 types 6-7 tokens per type	group 3: level B.1, n=5 group 4: level B.2, n=4
control condition: <i>sein</i> + adjectives 45 tokens, 15 types	group 5: level B.1, n=4 group 6: level B.2, n=5

#### (2.3) Productivity: Operationalisation

- (1) increase of attempts at target in production (cf. Fig. 3)
- (2) decrease of alternative constructions in target contexts
- (3) increasing type frequency in production (cf. Fig. 5)
- (4) increasing morphosyntactic & combinatorial variability (Fig. 6)
- (5) high number of hapax legomena (relative to overall frequency)
- (6) extension to lemmas that have not been experienced in the new construction (development of verb class schema) (Fig. 2)
- (7) temporary overproductivity (cf. Fig. 7, 8)

#### (2.4) Results: Entrenchment, Generalisation, Productivity

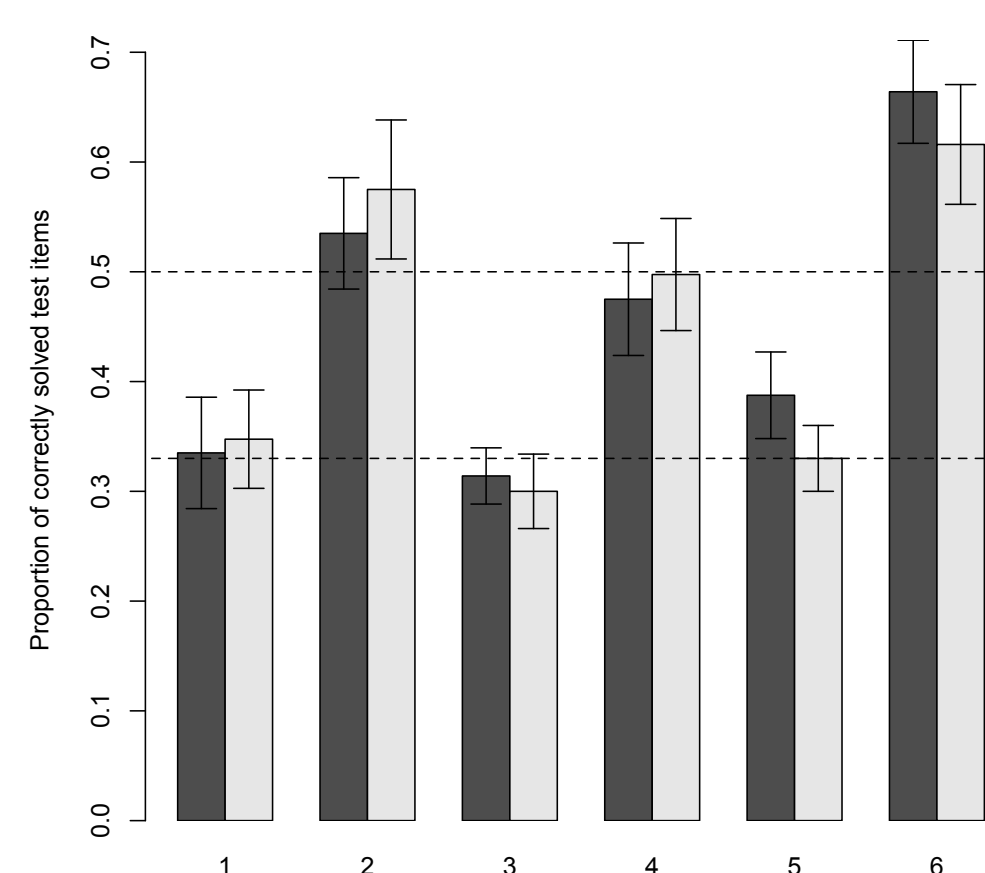


Fig. 1 Overall proportion of correctly solved items per group

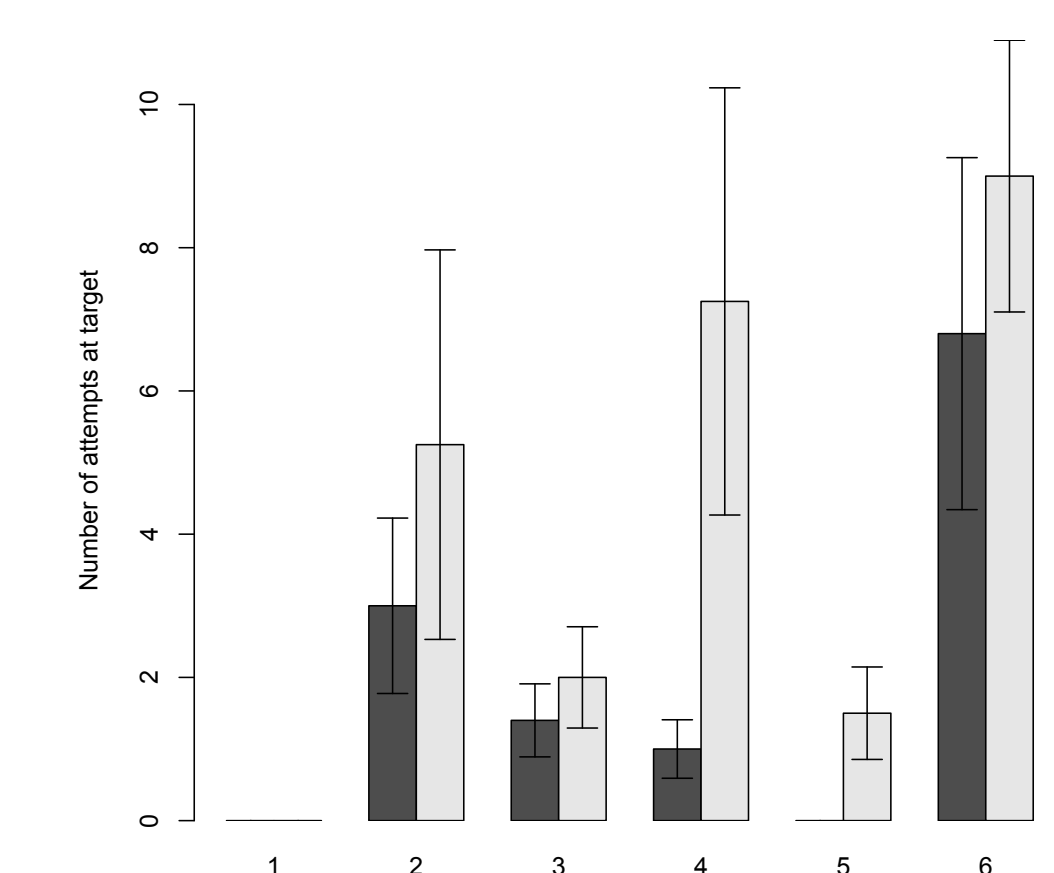


Fig. 3 Number of attempts at target

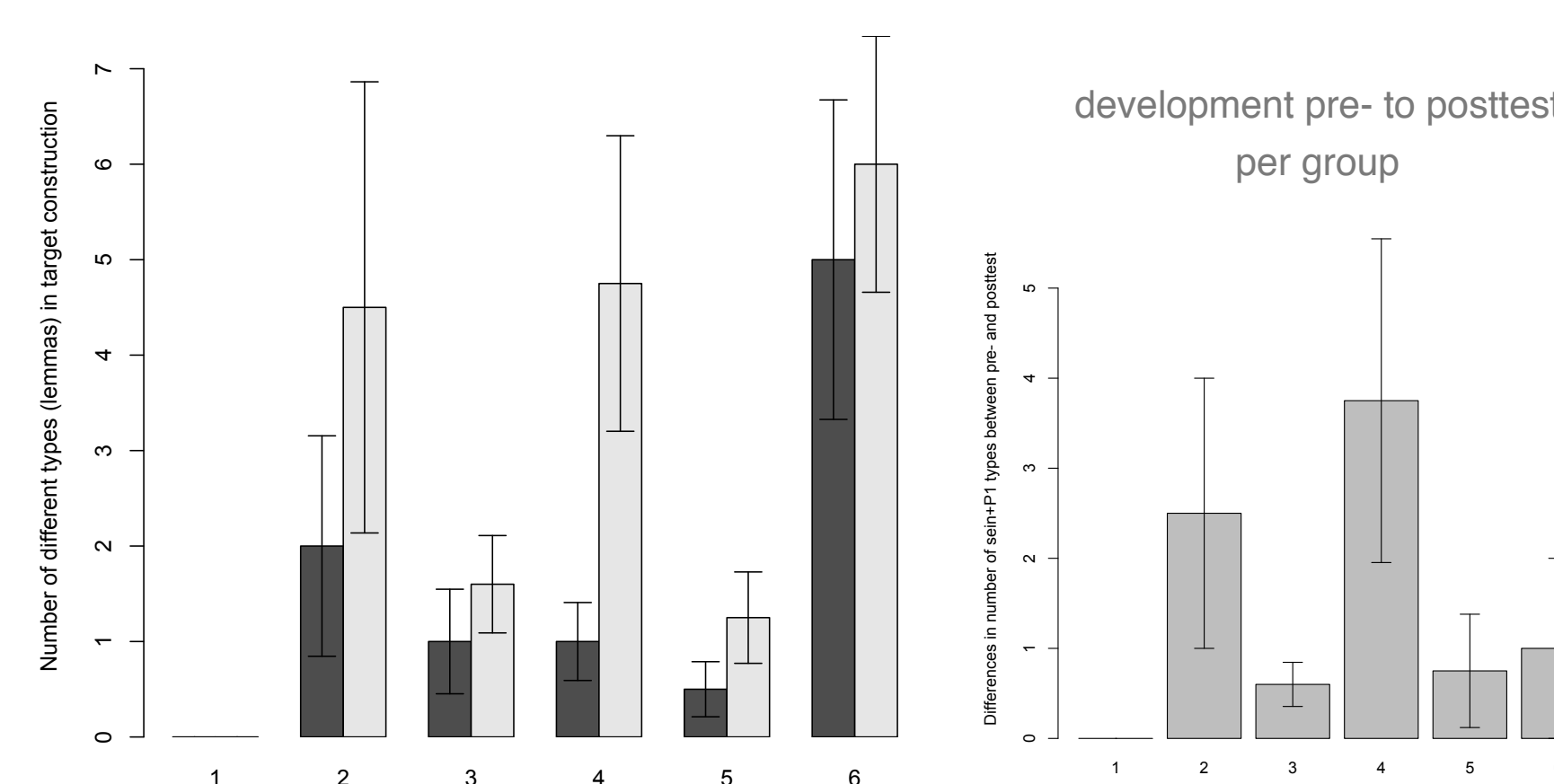


Fig. 5a, b *Sein*+P1 type frequency in production

Fig. 2 Accepted correct *sein*+P1 in posttest acceptability judgements

>> overall increase in attempts at target  
>> **group 2** is outperformed by **group 4**, especially in generalisation contexts (transfer to new situations)

>> treatment groups: overall increase in productivity as measured by type frequency and morphosyntactic variability  
>> tendency for **group 4** to outperform **group 2**

Fig. 4 Attempts at target, trained P1

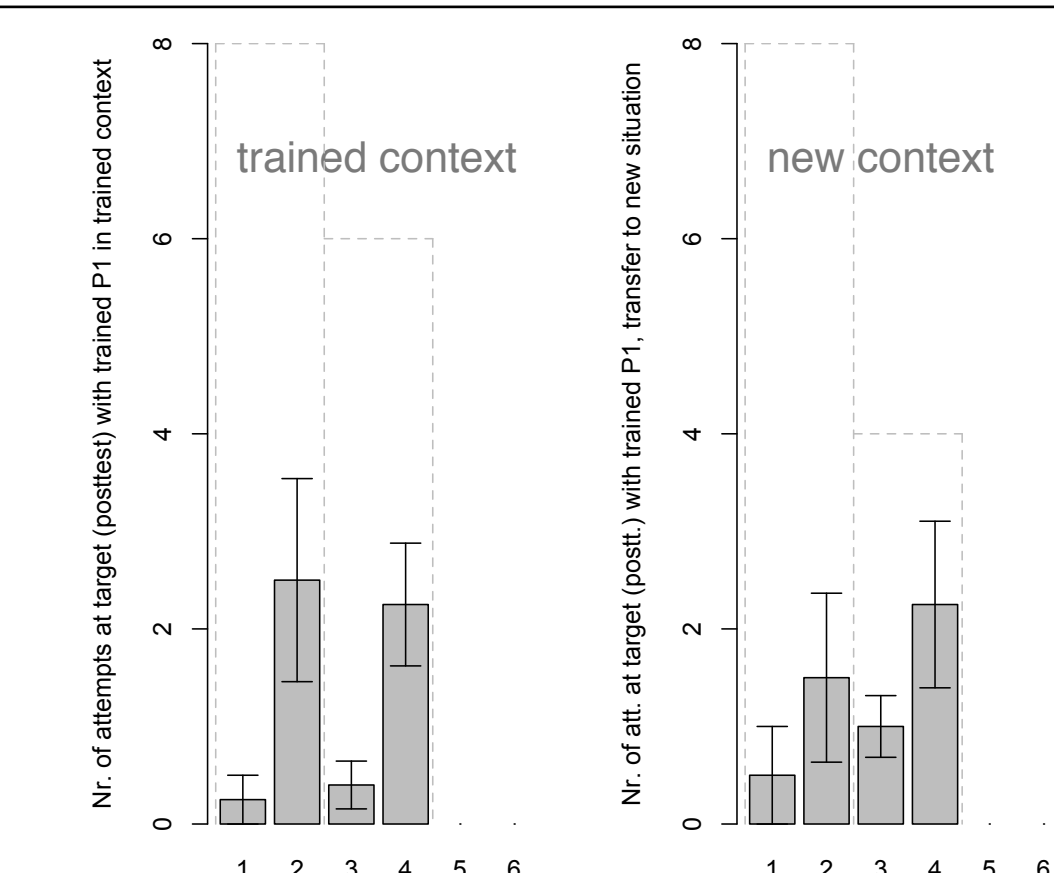
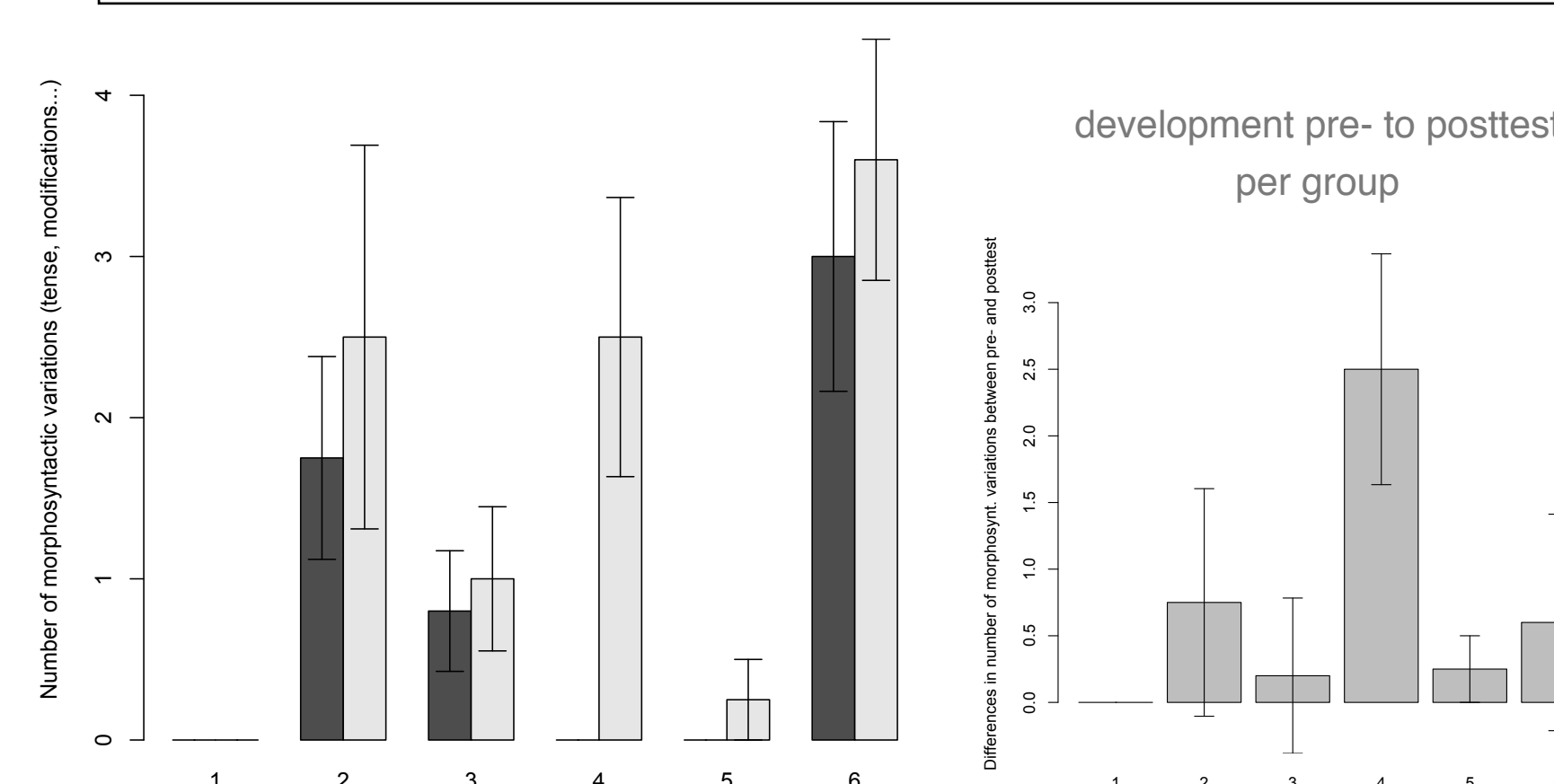


Fig. 6a, b *Sein*+P1 morph. variability in production



>> **group 4** scores badly, esp. compared to **group 2** on trained P1, to **group 3** on untrained P1

#### (2.5) Results: Overproductivity

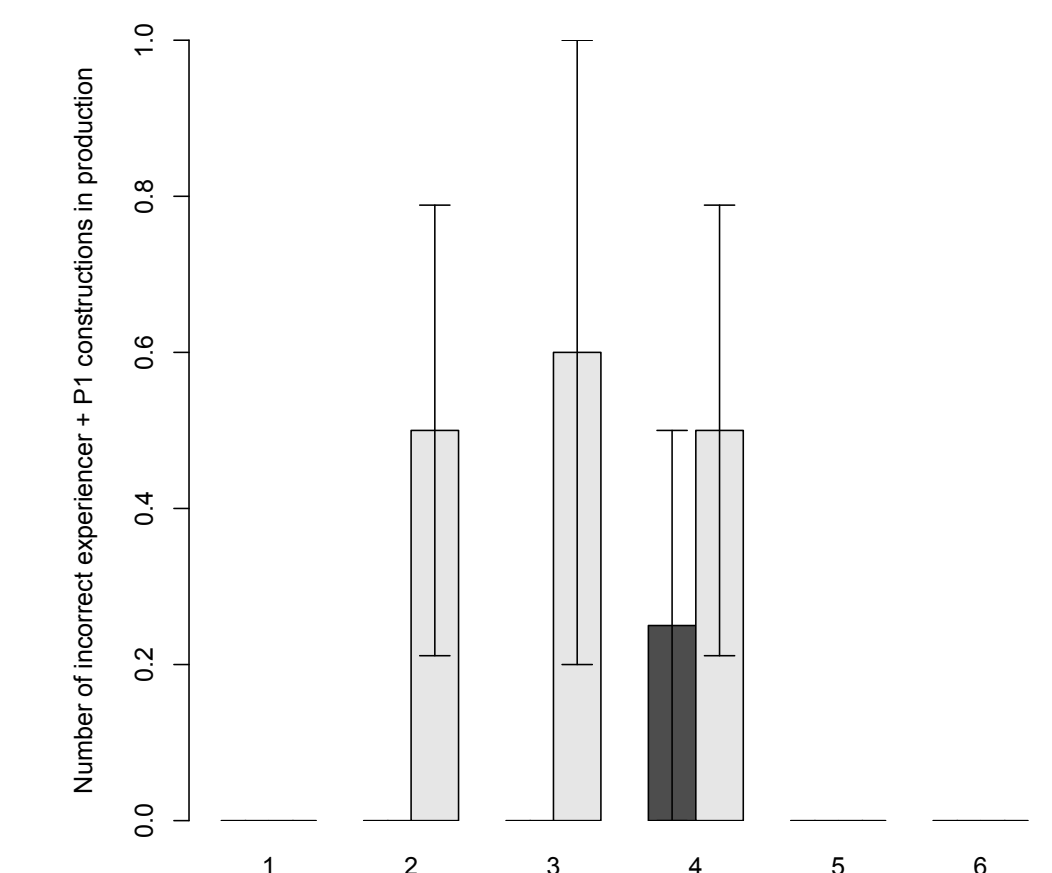
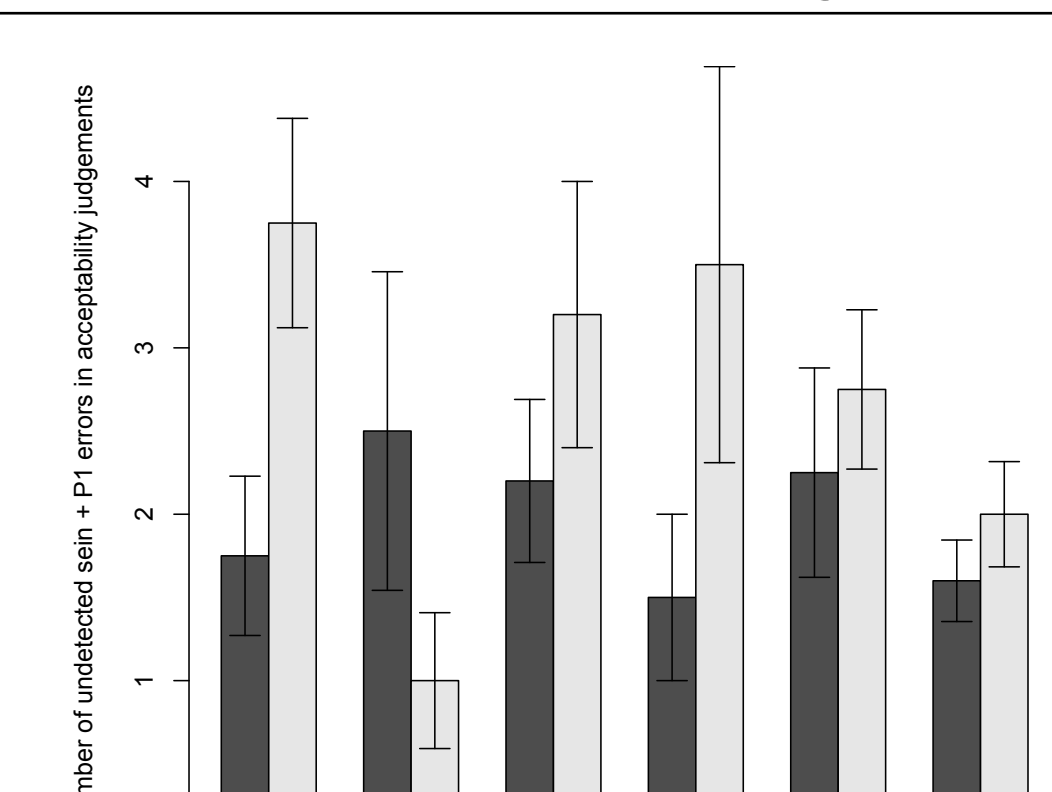


Fig. 7 Experienter+P1 constructions (type \**da war ich überraschend*)

>> strong increase in test conditions, indicating overgeneral representation of the new schematic construction

Fig. 8a, b Undetected incorrect *sein*+P1 in acceptability judgements



>> overall decrease in performance on error detection; exception: **group 2**

#### (2.6) Discussion

- (1) The preliminary results from the pilot study indicate that **there are frequency effects in instructed adult SLA**. Effects of overall type frequency are indicated by the differences (at least in trends) between group 2 and group 4 on most variables.
- (2) Contrary to the entrenchment hypothesis, both test conditions lead to the development of representation of the target construction at some level of abstraction. Contrary to the generalisation hypothesis, **group 4 actually outperforms group 2 on most measures of productivity** (except acceptability judgements). This suggests an initial role for skewed input, awaiting further investigation.
- (3) Groups 1 and 2 seem to be overtaxed and confused on the whole, only the advanced learners being able to extract some pattern, but not to use it productively, thus resorting to alternative constructions (*sein*+P2: known; *sein*+Vinf: approx. to target; causative adjectives (\**erschrecklich*, \**schocklich*)). Similar **effects on neighboring constructions** for group 3 (increasing *sein*+P2, incl. \**stimulus*+P2).