Processing EXPERIENCE

The licensing of object-first structures in German | Evaluating stability across relative data types

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1 | Introduction

Previous studies have related the differences between corpus frequency data and judgment data to different processing modules [3]:

- **Judgments** represent the cognitive workload for structure processing
  - The data structure reveals finer-grained distribution of the relevant factors
- **Frequency** reflects output selection for linguistic production
  - The data structure reveals strong preferences of few particular over other competitive structures

In our study:

1 We compare different data types resulting from different methods...
2 ...along with the phenomenon of word order freedom in German accusative experiencer structures (ACCEXP)

Here:

- We obtained relative instead of absolute judgments.
- We tested intuition-based frequency arising from choices out of manipulated sets of alternatives instead of corpus frequencies [2], [3], [6].

2 | Hypotheses

Method-related predictions:

judgment vs. frequency:

→ The relative distributions of the two measures match per condition, but they differ in strength

choice frequency vs. corpus frequency:

→ The relative frequencies reflect gradient well-formedness rather than production (cf. [3])

- Phenomenon under investigation: German object-experiencer verbs are known to license object-before-subject order (O>S).
- The factorial design contains three binary variables:

CONTEXT:	licensing context (triggering of object fronting) vs. non-licensing context (no triggering of object fronting)
VERBTYPE:	object-experiencer vs. canonical verbs
WORDORDER:	S>O vs. O>S

Content-related predictions:

→ The factors CONTEXT and VERBTYPE have significant impact on WORDORDER.

3 | Data

Judgment data:

- Obtained via split-100-rating [2]: subjects rated the S>O and O>S version of the same utterance corresponding to one of the four permutations of CONTEXT*VERBTYPE. Out of a score of 100 subjects award points to both alternatives (e.g. 50/50, 0/100, 80/20...).
- Thus, all structural alternatives were explicitly evaluated by the subjects.

→ subjects give a relative judgment of the well-formedness of the alternatives

Frequency data:

- Obtained via two-alternatives forced choice study [1], [4], [7]: subjects chose between the S>O and O>S version of a contextually embedded sentence.
- Thus, not all structural alternatives are explicitly evaluated

→ It is possible that subjects reject a well-formed structure or that they decide for a non-well-formed

- Licensing context: part-whole relationship between the subject of the context sentence and the object of the target sentence + adversativity [11]

Example:

[Die meisten Marktverkäufer] hatten Angst vor der Zukunft.
‚Most of the marketers were afraid of the future. '

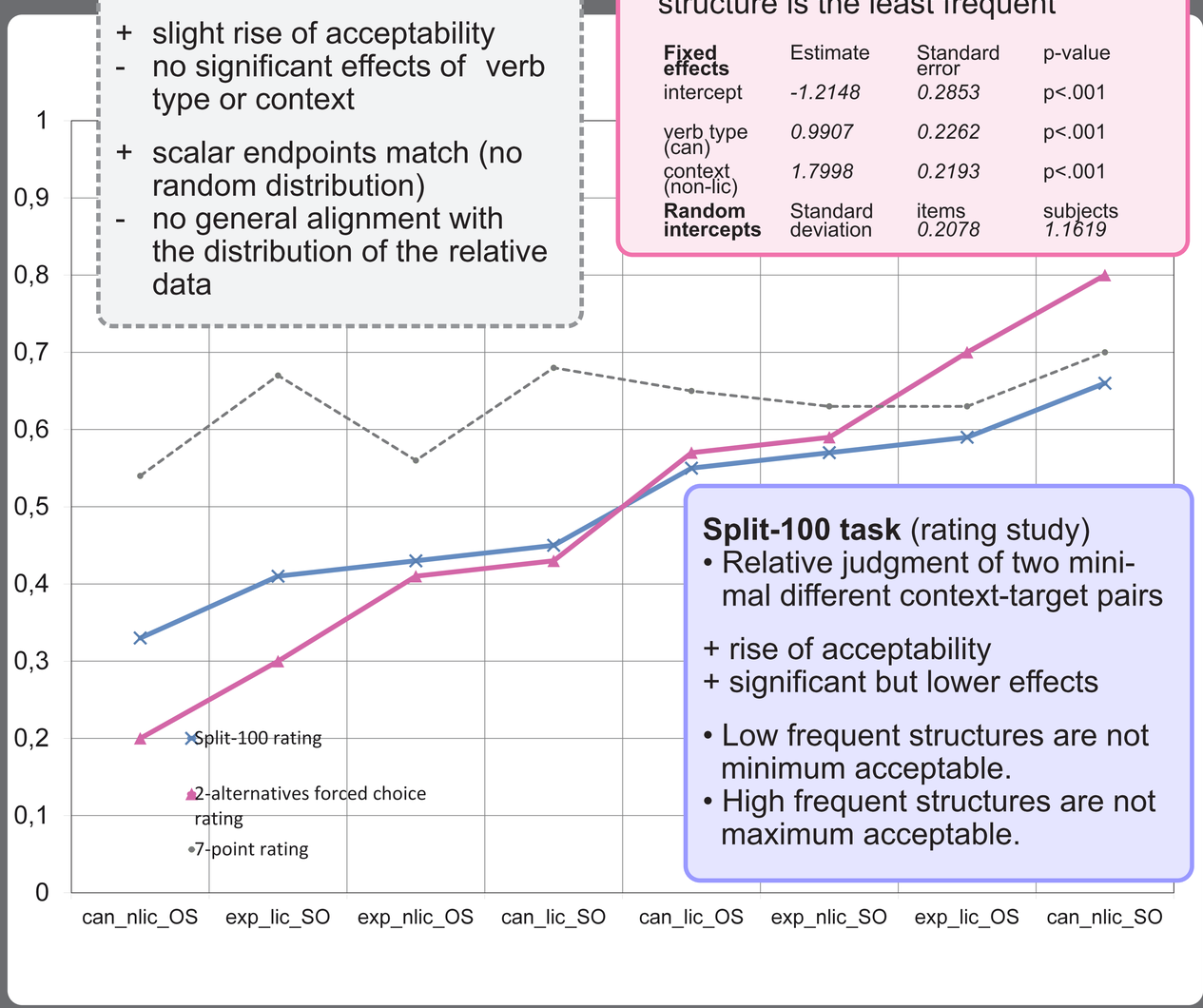
S>O: Der Umsatz hat den Fleischer erfreut$_{EXP}$/ gerettet$_{CAN}$.

O>S: [Den Fleischer] hat der Umsatz erfreut$_{EXP}$/ gerettet$_{CAN}$.
'The butcher was pleased/secured by the sales.'

- Non-licensing context: the 'all-new' context "Was gibt es Neues?" ('What's new?')
- 16 canonical transitive verbs / 16 accusative experiencer verbs
- Both experiments have identical material and factorial structure.
- online studies[1] with 32 subjects
- Multifactorial nature of linearization constitutes a promising data base: context & verb type & word order of a structure influence acceptability/ choice probability.

4 | Results

Fig.: Normalized frequency/ rating of the ranked conditions



7-Point Rating (check study)

- Non-relative judgment of context-target pair

\+ slight rise of acceptability
\- no significant effects of verb type or context

\+ scalar endpoints match (no random distribution)
\- no general alignment with the distribution of the relative data

Forced choice task (frequency study)

- Choice out of two minimal different context-target pairs

\+ rise of choice probability
\+ significant effects of verb type and context

- The most acceptable structure is the most frequent, the less acceptable structure is the least frequent

Fixed effects	Estimate	Standard error	p-value
intercept	*-1.2148*	*0.2853*	p<.001
verb type (can)	*0.9907*	*0.2262*	p<.001
context (non-lic)	*1.7998*	*0.2193*	p<.001
Random intercepts	Standard deviation	items *0.2078*	subjects *1.1619*

Split-100 task (rating study)

- Relative judgment of two minimal different context-target pairs

\+ rise of acceptability
\+ significant but lower effects

- Low frequent structures are not minimum acceptable.
- High frequent structures are not maximum acceptable.

5 | Conclusion & Discussion

Method-related conclusion:

judgment vs. frequency:

→ The relative distribution of the data points is the same for both data types but for some conditions the effect size is larger for frequency than for judgments.

- There is an alignment of effects on well-formedness and choice probabilities.
- This reinforces the ranking of the effects of the underlying factors.
- The differences in strenght cannot be associated with non-controlled factors, but rather with the underlying process.

choice frequency vs. corpus frequency:

→ Corpus frequencies typically reveal very strong preference for one and zero for other structures. We find a high occurence probability for more than one condition and no condition with highest or zero frequency.

- Choice vs. corpus: conscious output selection process out of a limited number of overt competitors vs. unconscious output selection out of an unlimited number of non-overt competitors.
- Choice & corpus: not all structural alternatives are explicitly evaluated (vs. scalar judgment & categorical yes/no-frequencies).

Forced choice frequencies share properties of both levels:
They reflect gradient well-formedness as well as strong preferences of an output-selection process. Contrary to the above hypothesis, they uncover both cognitive workload and production-related choice.

Content-related conclusion:

→The manipulated context licenses object fronting & ACCEXP-verbs license O>S-order without the contextual licensing.

Stability across data types? → No stability of effects with 7-point judgments

- Compared to non-relative judgments, 2-alternatives forced choice & relative rating reduce the emergence of uncontrolled factors.
- Collecting relative judgments is the best method in case of contextual dependence, multifactorial nature & general grammaticality of the tested structures.

References | Footnotes

[1] Arppe, A. & Juhani J. 2007. Every method counts: Combining corpus-based and experimental evidence in the study of synonymy. [2] Bresnan, J. 2007. Is syntactic knowledge probabilistic? Experiments with the English dative alternation. [3] Featherston, S. 2005. The Decathlon Model of empirical syntax. [4] Jónsson, J. G. 2009. Covert nominative and dative subjects in Faroese. [5] Keller, F. 2001. Gradience in Grammar. [6] Kempen, G. & Harbusch, K. 2005. The relationship between grammaticality ratings and corpus frequencies: A case study into word order variability in the midfield of German clauses. [7] Rosenbach, A. 2003. Aspects of iconicity and economy in the choice between the s-genitive and the of-genitive in English. [8] Sorace, A. and Keller, F. 2005. Gradience in linguistic data. [9]] Sprouse, J. & Almeida, D. 2012. Assessing the reliability of textbook data in syntax: Adger's Core Syntax. [10] Sprouse, J. & Schütze, C.T. & Almeida, D. submitted). comparison of informal and formal acceptability judgments using a random sample from Linguistic Inquiry 2001-2010. [11] Weskott T., Hörnig, R., Fanselow G. & Kliegl, R. 2011. Contextual Licensing of Marked OVS Word Order in German.; [1] Online experiments created with OnExp: http://onexp.textstrukturen.uni-goettingen.de/