Filler complexity in wh-extractions from islands and non-islands

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I. Introduction

Hofmeister and Sag (2010) and Hofmeister (2008) found that the processing of filler-gap dependencies with an extracted *wh*-phrase in English is sensitive to the complexity of the *wh*-phrase (also cf. Frazier and Clifton, 2002).

▶ Reading times of the word after the extracted *wh*-phrase were longer after a *which*-phrase than after a bare *wh*-word.

▶ At the gap site, in contrast, RTs were shorter for '*which*-gaps' than for bare '*wh*-gaps'.

Suggested reasons: greater informativity of *which*-phrase, therefore –
▶ reduced likelihood of misanalysis ('early gap filling') so no continued reanalysis
▶ easier retrieval due to increased activation and resistance to interference

▶ Our findings from German call the generality of these findings and their interpretation into question.

II. Methods

Exp. 1: Self-Paced Reading
▶ Non-cumulative word-by-word presentation in a stationary window
▶ Task: reading + answer task
▶ 48 Participants saw 36 critical items and 110 unrelated fillers each

Exp. 2: Acceptability Judgement
▶ Thermometer Judgement paradigm (Featherston, 2008) – Participants judged sentence pairs relative to two fixed anchor sentence pairs
▶ 36 Participants saw 36 critical items and 64 unrelated fillers each

2×3 Design

▶ SENTENCE TYPE: BASELINE – no island violation; CNPC – violation of the Complex Noun Phrase Constraint
▶ FILLER TYPE: BARE – bare *wh*-pronoun; WHICH – *which*-NP phrase; ADJ – a *which*-NP phrase with adjective and adverb

III. Materials

Context: 'Nils will betray (the fact) that Jana has backed the beguiler who was on the run and is acceptably known.'

Question:

	BARE	WHICH	ADJ				
BASELINE	*Wen*$_i$/	*Welchen Betrüger*$_i$/	*Welchen hinreichend bekannten Betrüger*$_i$	wird Nils		verraten, dass Jana t$_i$ gedeckt hat?
CNPC	*Wen*$_i$/	*Welchen Betrüger*$_i$/	*Welchen hinreichend bekannten Betrüger*$_i$	wird Nils die Tatsache	verraten, dass Jana t$_i$ gedeckt hat?
	who	which beguiler	which acceptably known beguiler	will Nils the fact	betray	that Jana backed has

'*Who*/ *Which beguiler*/ *Which acceptably known beguiler* will Nils betray (the fact) that Jana has backed?'

Answers: (only SPR)

CORRECT	*den flüchtigen Betrüger* 'the fugitive beguiler'	RELATED	*den müden Betrüger* 'the tired beguiler'	DISTRACTOR	*den großen Dieb* 'the tall thief'

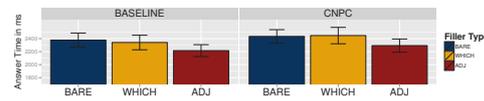## IV. Results

Exp. 1: Residual Reading Times
(2-way repeated measures ANOVAs)
▶ **No main effects for SENTENCE TYPE**
▶ **Main effects for FILLER TYPE:** Matrix clause (3 words after filler): longer RTs for ADJ than for BARE/WHICH; Retrieval region (embedded clause verb and aux): longer RTs for ADJ than for BARE/WHICH

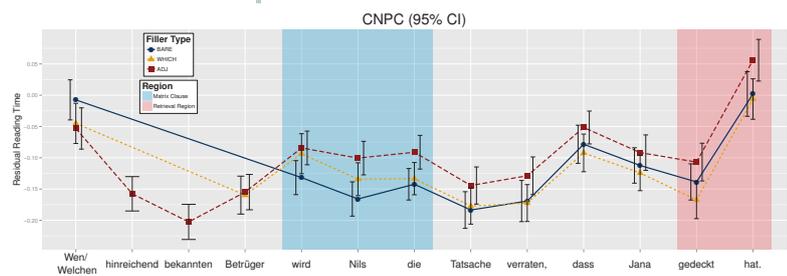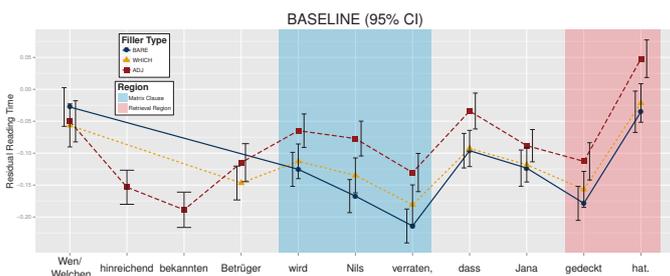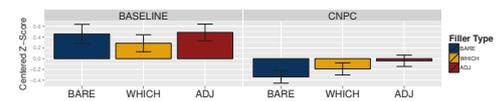**Exp. 1: Answer Times**
(2-way repeated measures ANOVAs)
▶ **Main effect of SENTENCE TYPE:** BASELINE faster than CNPC
▶ **Main effect of FILLER TYPE:** ADJ faster than WHICH/BARE
▶ High overall answer accuracy (93%–95% per condition)

Exp. 2: Acceptability Judgments
(Z-Scores and 2-way repeated measures ANOVAs)
▶ **Main effect of SENTENCE TYPE:** BASELINE more acceptable than CNPC
▶ **Interaction of SENTENCE TYPE and FILLER TYPE:**
BASELINE: BARE=WHICH=ADJ; CNPC: BARE<ADJ

V. Discussion

Summary

▶ Exp. 1: Retrieving a more complex *wh*-phrase is more, rather than less costly than retrieving a less complex *wh*-phrase – evidenced by the reading times for ADJ.

▶ The disadvantage of a very complex *wh*-filler at the retrieval site might be due to the activation of more semantic features, which is indicated by the advantage of ADJ in the answer times (exclusion of answer alternatives).

▶ Exp. 2: In ungrammatical island violations, increasing informativity of the *wh*-filler improves overall acceptability.

Interpretation

▶ Probably a trade-off: more complex structural information is more costly to process but more semantic information also helps to identify referents in a discourse.

Possible reasons for differences with other studies:
▶ Much greater syntactic complexity of the most informative condition (ADJ)
▶ Verb final sentence structure of German: retrieval region = sentence wrap up region

▶ German *wh*-pronouns are more informative than English ones (case)

▶ Maybe not only reading time effects but also answer task preparation

Implications

▶ Higher processing effort pays off in terms of better success at interpretation.

▶ Processing in non-island and island structures does not differ.

▶ More research on languages with differing morpho-syntax is needed.

Featherston, S. (2008). Thermometer judgments as linguistic evidence. In Riehl, C. M. and Rothe, A., editors, Was ist linguistische Evidenz?, pages 96–90. Shaker Verlag, Aachen.
Frazier, L. and Clifton, C. (2002). Processing "d-linked" phrases. Journal of Psycholinguistic Research, 31(6):633–659.
Hofmeister, P. (2008). Representational Complexity and Memory Retrieval in Language Comprehension. PhD thesis, Stanford University, Palo Alto, CA.
Hofmeister, P. and Sag, I. (2010). Cognitive constraints and island effects. Language, 86(2):366–415.