Improve Single Library and Inter-library Interaction Issues in the Grammar Matrix

18th DELPH-IN Summit
Tongxi(Tom) Liu

Sources of the Issues
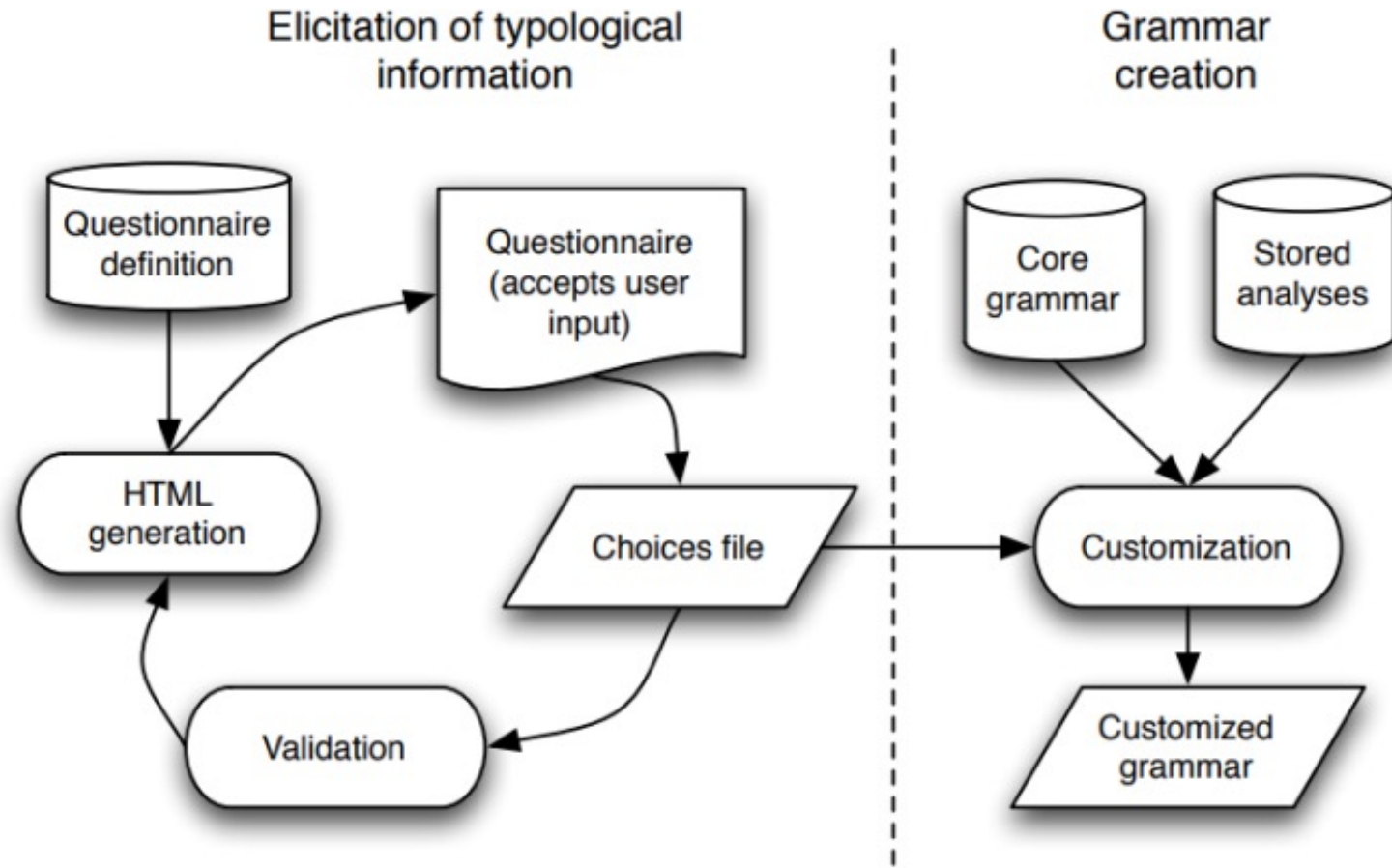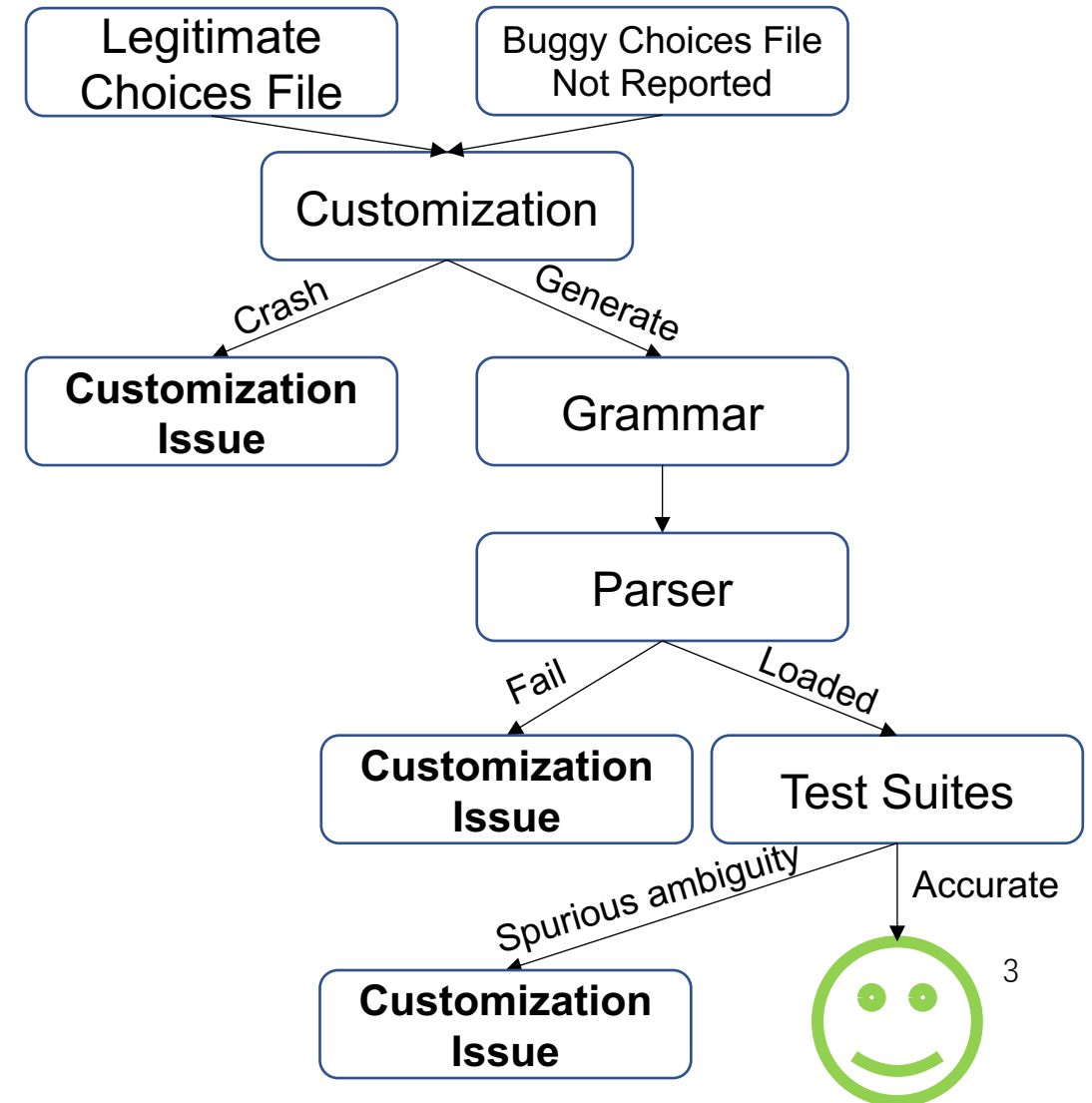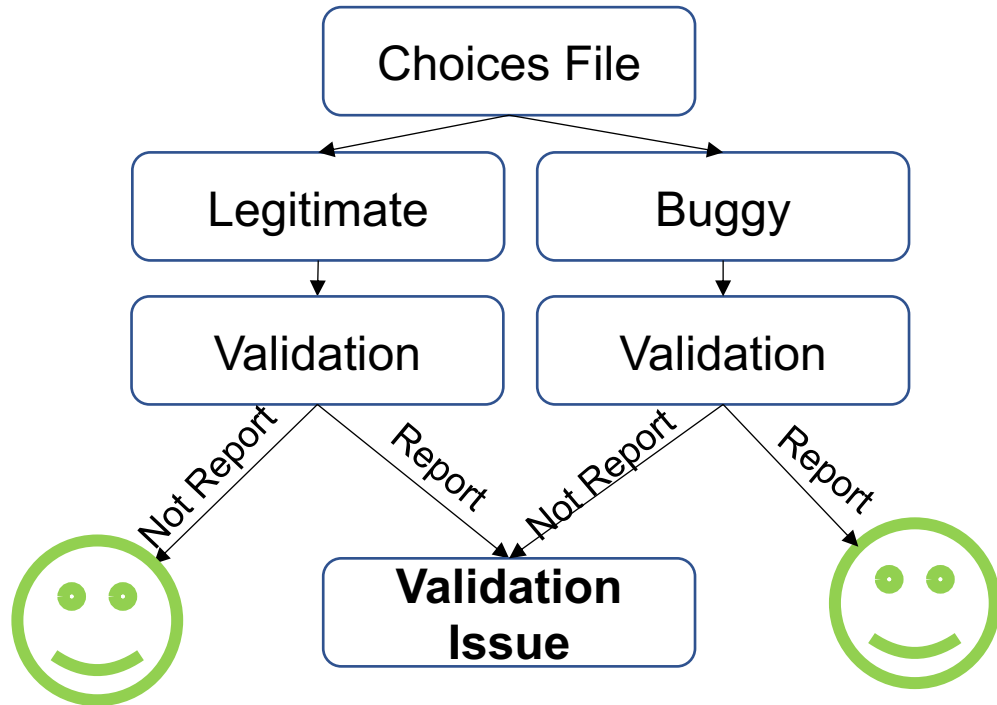

Fig. 1 Schematic system overview (Bender et al. 2010, p. 29)

Sources of the Issues

3

Results

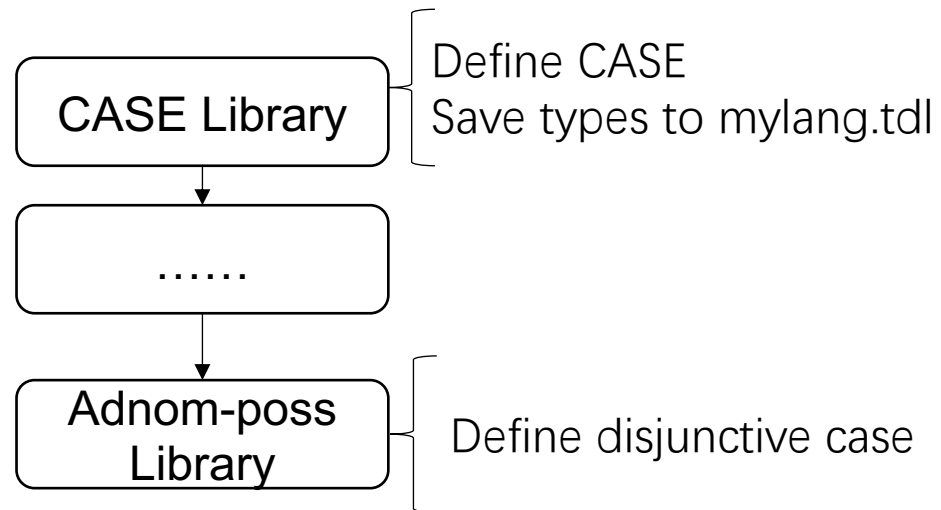Customization Issue #621: adnom-poss library does not fully create disjunctive case types

```
POSS-OBL-noun-lex := poss-pron1-noun-lex &
  [ SYNSEM.LOCAL.CAT.HEAD.MOD.FIRST.LOCAL.CAT.HEAD.CASE non-abs ].
```

```
;;; Case

case := *top*.
real-case := case.  ; intermediate case type for all real cases
erg := real-case.  ; erg
abs := real-case.  ; abs
new := real-case.  ; new
```

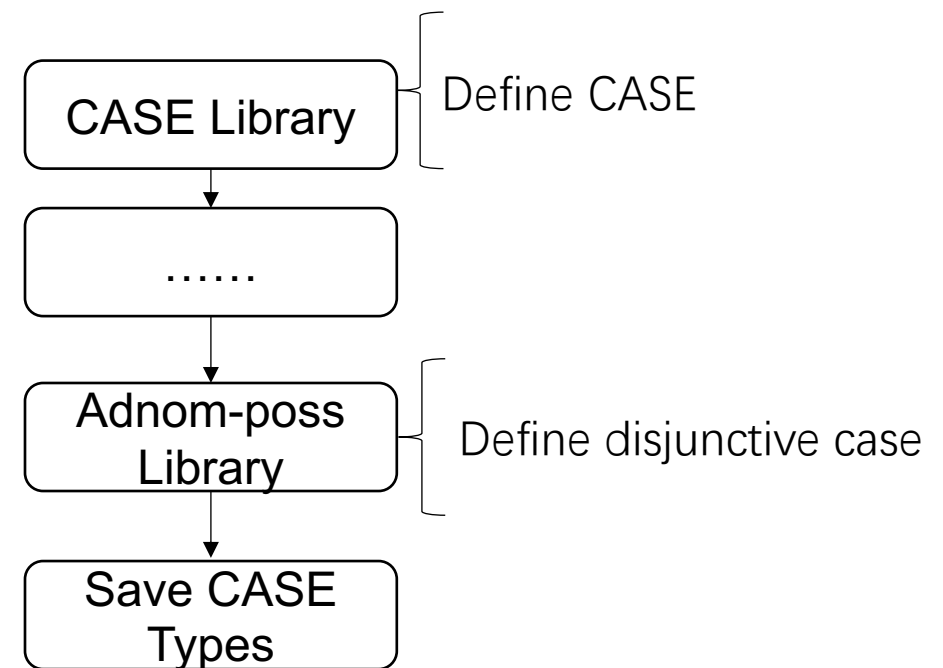# Results

Customization Issue #621: adnom-poss library does not fully create disjunctive case types

Previous CASE Creation Process

CASE Library → Define CASE
Save types to mylang.tdl

↓

......

↓

Adnom-poss Library → Define disjunctive case

New CASE Creation Process

CASE Library → Define CASE

↓

......

↓

Adnom-poss Library → Define disjunctive case

↓

Save CASE Types

Results

Customization Issue #621: adnom-poss library does not fully create disjunctive case types

```
;;; Case

case := *top*.
real-case := case.   ; intermediate case type for all real cases
abs := real-case.   ; abs
non-abs := real-case.
erg := non-abs.
new := non-abs.
```

Results

#632: poss-phrase-1 does not have the binary-non-loc-phrase supertype
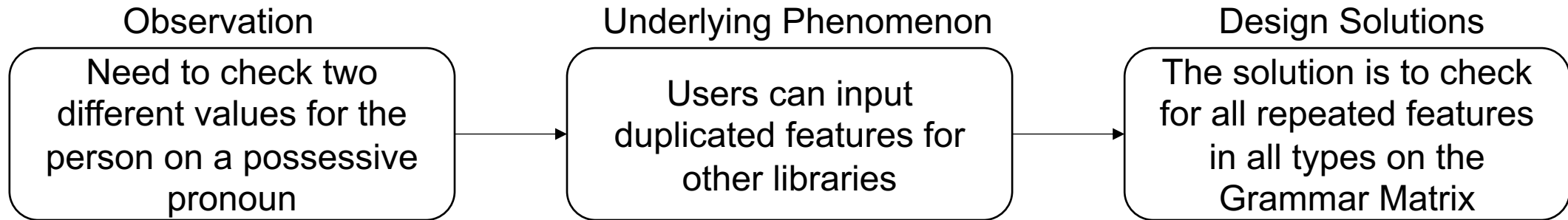#625: poss lex rules leave NON-LOCAL features underspecified

```
poss-phrase-1 := head-final &
  [ SYNSEM.LOCAL.CAT [ HEAD #head,
               VAL [ COMPS < >,
                   SUBJ < >,
                   SPEC < >,
                   SPR < > ] ],
    HEAD-DTR.SYNSEM.LOCAL [ CAT [ POSSESSUM
nonpossessive,
                 HEAD #head & noun &
                   [ POSSESSOR nonpossessive,
                     PRON - ],
                 VAL.SPR < [ ] > ],

...
```
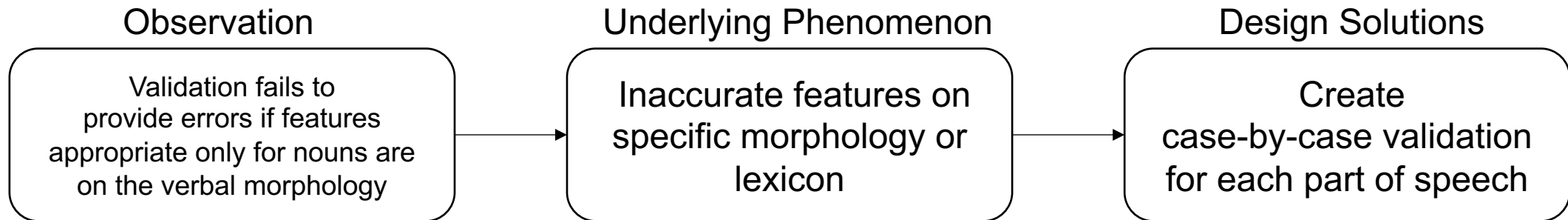
Results: Validation Issues

#622: validation fails to block giving two separate values for the person on a possessive pronoun

Observation	Underlying Phenomenon	Design Solutions
Need to check two different values for the person on a possessive pronoun	Users can input duplicated features for other libraries	The solution is to check for all repeated features in all types on the Grammar Matrix

#623: validation needs to check for nouny features on verby morphology

Observation	Underlying Phenomenon	Design Solutions
Validation fails to provide errors if features appropriate only for nouns are on the verbal morphology	Inaccurate features on specific morphology or lexicon	Create case-by-case validation for each part of speech

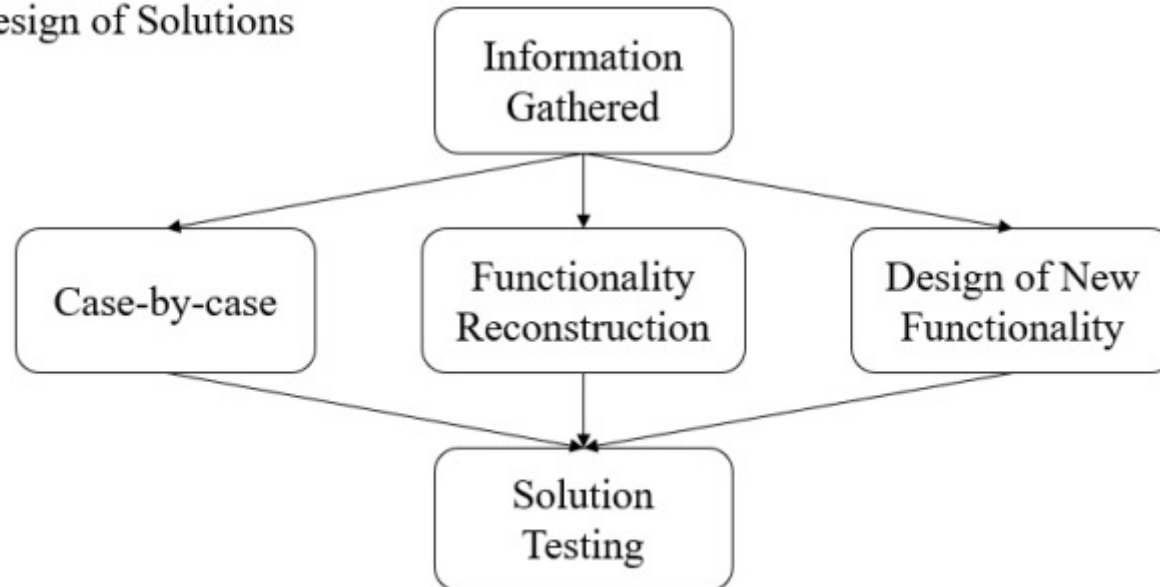#627: validation fails to block for verb types and supertypes both indicating valence

……

Discussion

Cause of the Issue

Design of Solutions

References

Bender, E. M., Drellishak, S., Fokkens, A., Poulson, L., & Saleem, S. (2010). Grammar customization. *Research on Language and Computation*, *8*(1), 23–72.

Bender, E. M., Flickinger, D., & Oepen, S. (2002). The grammar matrix: An open-source starter-kit for the rapid development of cross-linguistically consistent broad-coverage precision grammars. In J. Carroll, N. Oostdijk, & R. Sutcliffe (Eds.), *Proceedings of the workshop on grammar engineering and evaluation at the 19th international conference on computational linguistics* (pp. 8–14). Taipei, Taiwan: ACLCLP.

Bender, E. M., Poulson, L., Drellishak, S., & Evans, C. (2007, June). Validation and regression testing for a cross-linguistic grammar resource. In *ACL 2007 workshop on deep linguistic processing* (pp. 136–143). Prague, Czech Republic: Association for Computational Linguistics. Retrieved from `Mhttps://aclanthology.org/W07-1218`

Copestake, A., Flickinger, D., Pollard, C., & Sag, I. A. (2005). Minimal recursion semantics: An introduction. *Research on language and computation*, *3*(2), 281–332.

Drellishak, S. (2008). Complex case phenomena in the Grammar Matrix. In *The proceedings of the 15th international conference on head-driven phrase structure grammar* (pp. 67–86). CSLI Publications, Stanford.

Goodman, M. W. (2019, October). A python library for deep linguistic resources. In *2019 pacific neighborhood consortium annual conference and joint meetings (pnc)*. Singapore.

Nielsen, E. K. (2018). *Modeling adnominal possession in the Lingo Grammar Matrix* (Unpublished master's thesis).

Pollard, C., & Sag, I. A. (1994). *Head-driven phrase structure grammar*. University of Chicago Press.

Sag, I. A., Wasow, T., & Bender, E. M. (2003). *Syntactic theory: A formal introduction* (Vol. 92). CSLI.

Trimble, T. J. (2014). *Adjectives in the Lingo Grammar Matrix* (Unpublished master's thesis).

Zamaraeva, O. (2021). *Assembling syntax: Modeling constituent questions in a grammar engineering framework* (Unpublished doctoral dissertation).