

An underspecification approach to Hausa resumption

Berthold Crysmann

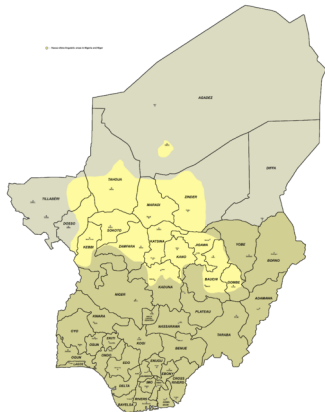
`crysmann@linguist.univ-paris-diderot.fr`

CNRS, Laboratoire de linguistique formelle (UMR 7110), Paris-Diderot

HEADLEX 2016, Warsaw

Introduction

- ▶ Hausa is a major Afroasiatic language (Chadic sub-branch) spoken by over 35 million speakers in Northern Nigeria and bordering Niger
- ▶ Unbounded dependency constructions (UDCs) in Hausa feature both
 - ▶ standard extraction (filler–gap dependencies)
 - ▶ resumptive pronoun strategy
- ▶ Resumptive elements include
 - ▶ free pronouns
 - ▶ bound pronominal affixes
 - ▶ zero anaphora (see below)



Resumption vs. gap strategy

- ▶ Choice of extraction strategy partially determined by the governing head
- ▶ Possessor complements of nouns only permit resumption

(1) $w\grave{a}_i$ ka àuri 'ya-r - $s\grave{a}_i$ / 'yā $*\emptyset_i$
who 2.M.CMPL marry daughter.F-of.F -3S.M daughter
'Whose daughter did you marry?' (Jaggar, 2001)

- ▶ Complements of true prepositions equally do not permit gap strategy

(2) $s\grave{a}nd\bar{a}_i$ sukà d\grave{o}k\bar{e} shì dà $it\bar{a}_i$ / $*\emptyset_i$
stick 3P.CPL beat 3S.DO with 3S.F
'It was a stick they beat him with.' (Jaggar, 2001)

Human direct objects

- ▶ Direct objects of verbs, dynamic nouns, and verbal nouns can extract by way of a filler-gap dependency
- ▶ Overt resumptives are considered marginal

“Deletion is [...] the strongly preferred strategy for relativisation on direct objects.” (Jaggar, 2001, p. 534)

- (3) a. yārò_i **dà** sukà dōkā \emptyset_i yanà asìbitì
boy REL 3P.CPL beat up 3.S.M.CONT hospital
‘The boy they beat up is in hospital’ (Jaggar, 2001, p. 534)
- b. gā yārin_i **dà** nakè sô \emptyset_i
there is girl REL 1.S.CONT want.VN
‘There’s the girl I love.’ (Jaggar, 2001, p. 534)
- c. ìnā littāfī_i **dà** kakè mǎganà \emptyset_i
where book REL 2.S.M.CONT talking
‘Where is the book you’re talking about?’ (Jaggar, 2001, 534)

Human direct objects

- ▶ Marginality of resumption in highest clause familiar from subjects in Hebrew (Borer, 1984) and Irish (McCloskey, 1990)
- ▶ Resumption fine for more deeply embedded human objects (non-islands)

(4) mùtumìn_i dà dālìbai sukà san [cêwā mālàma-r-sù
man REL students 3P.CPL know COMP teacher-L.F-3P.GEN
tanã sô-n-sà_i / sô Ø_i]
3.S.F.CONT like.VN-L-3.S.M.GEN / like.VN
'the man that the students know that their teacher likes'
(Newman, 2000, 539)

Human direct objects

- ▶ Resumptives also found in across-the-board extraction from coordination
- ▶ ATB extraction in Hausa allows mixing of gap and resumptive strategy

(5) [àbōkī-n-ā]_i dà [[na zìyartà \emptyset_i] àmmā [bàn
friend-L-1.S.GEN REL 1.S.CPL visit but 1.S.NEG.CPL
sāmē **shì**_i à gidā ba]]
find 3.S.M.DO at home NEG
'my friend that I visited but did not find at home' (Newman,
2000, p. 539)

Human direct objects

- ▶ Resumption required with long relativisation
 - ▶ from complements of non-bridge verbs
 - ▶ from relative (or wh) clauses

- (6) gā yârân_i dà Àli ya radâ minì [wai ya
there are children REL Ali 3.S.CPL whisper 1.S.IO COMP 3.S.CPL
gan-sù_i / *ganī ∅ gida-n giyâ]
see-3P.DO / see ∅ house-L beer
'Here are the children that Ali whispered to me that he saw in the
bar.' (Tuller, 1986, 169)
- (7) gā mùtumìn_j dà ka ga yārin_iyàr_i [dà ∅_i ta
here.is man REL 2.S.M.CPL see girl REL 3.S.F.CPL
san shì_j / *sanī ∅_j]
know 3.S.M.DO / know ∅
'Here's the man that you saw the girl that knows him.' (Tuller,
1986, 85)

Indirect objects

- ▶ Both resumption and gaps possible with indirect objects

(8) mutânên_i dà sukà ki sayar musù / wà Ø dà àbinci
men REL 3P.CPL refuse sell 3P.IO / IOM with food
sukà fita
3P.CPL left
'the men they refused to sell food to left.' (Jaggar, 2001, 534)

- ▶ Resumption obligatory with long relativisation

(9) gà tābōbîn_j dà Àli ya san mùtumìn_i [dà Ø_i
here.is cigarettes REL Ali 3S.M.CPL know man REL
zâi yī musù_j / *wà Ø_j kwālī]
3S.M.FUT do 3P.IO / IOM Ø box
'Here are the cigarettes that Ali knows the man that will make a
box for.' (Tuller, 1986, 84)

Null pronouns

- ▶ Hausa has null subjects and null **non-human** direct objects

(10) a. Kā ga littāfi-n Mūsa?

2S.M.CPL see book-of Musa

‘Did you see Musa’s book?’

b. Ī, nā gan shì. / Ī, nā ganī ∅

Yes 1.S.CPL see 3S.M Yes 1.S.CPL see

‘Yes, I saw it.’

(Tuller, 1986, 61)

(11) a. Kā ga kanè-n Mūsa?

2S.M.CPL see brother-of Musa

‘Did you see Musa’s brother?’

b. Ī, nā gan shì. / *Ī, nā ganī ∅

Yes 1.S.CPL see 3S.M Yes 1.S.CPL see

‘Yes, I saw him.’

(Tuller, 1986, 62)

- ▶ Interpretation of zero arguments is specific (Jaggar, 2001; Tuller, 1986)

Null resumptives I

- ▶ Long relativisation out of relatives possible with pro-dropped arguments (subject and non-human direct object); cf. (Tuller, 1986)

(12) mùtumìn_i dà ka san littāfin_j [dà ∅_i ya
man REL 2S.M.CPL know book REL 3S.M.CPL
rubūtā ∅_j]
write
'the man that you know the book (he) wrote' (Tuller, 1986, 81)

(13) littāfin_i dà ka san mùtumìn_j [dà ∅_j ya
book REL 2S.M.CPL know man REL 3S.M.CPL
rubūtā ∅_i]
write
'the book that you know the man who wrote (it)' (Tuller, 1986, 81)

Null resumptives II

- ▶ Likewise, argument-drop permits relativisation out of wh-islands

(14) mùtumìn_i dà ka san [mè_j Ø_i ya rubùtā Ø_j]
man REL 2S.M.CPL know what 3S.M.CPL write
'the man that you know what (he) wrote' (Tuller, 1986, 80)

(15) littāfin_i dà ka san [wā_j Ø_j ya rubùtā Ø_i]
book REL 2S.M.CPL know who 3S.M.CPL write
'the book that you know who wrote (it)' (Tuller, 1986, 80)

- ▶ According to Tuller (1986), the pattern extends to
 - ▶ clausal subjects
 - ▶ complements of non-bridge verbs

Islands for wh-fronting I

- ▶ By contrast, wh-extraction cannot escape islands, e.g. relatives

- (16) * wà`nè mùtûm_i ka bā nì littāfîn_j dà ∅_i
which man 2S.M.CPL give me book REL
ya rubû`tā ∅_j
3S.M.CPL write
'Which man did you give me the book that wrote' (Tuller, 1986, 81)
- (17) * wà`nè littāfî_j ka san wā_i ∅_i ya rubû`tā ∅_j
which book 2S.M.CPL know who 3S.M.CPL write
'which book do you know who wrote' (Tuller, 1986, 80)

Islands for wh-fronting II

- ▶ Overt resumptives do not improve island sensitivity of wh-phrases

(18) *wā_j* ka yi mǎgǎnǎ dà *shī_j*
who 2S.M.CPL do talking with 3S.M
'Who did you talk with?' (Tuller, 1986, 158)

(19) * *wā_j* ka san mǎtâr_i [dà \emptyset _i ta yi mǎgǎnǎ
who 2S.M.CPL know woman REL 3S.F.CPL do talking
dà *shī_j*]
with 3S.M
'Who do you know the woman that talked to him' (Tuller, 1986, 159)

Triple relativisation

- ▶ Tuller (1986) cites a marginally acceptable example with triply nested relativisation

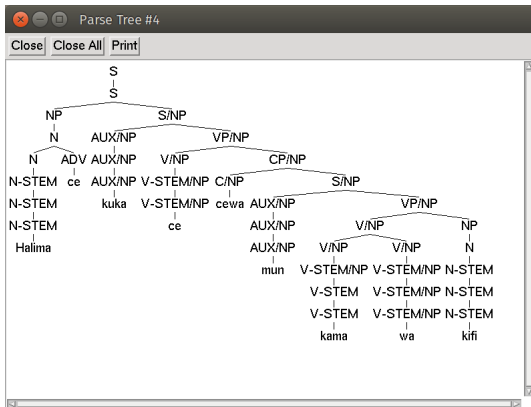
(20) ? gā mātâr_i dà ka bā nì littāfin_j dà
here.is woman REL 2S.M.CPL give me book REL
mālāmai sukà san mùtumìn_k dà ∅_i ta rubūtā
teachers 3P.CPL know man REL 3S.F.CPL write
wà ∅_k ∅_j
for
'Here's the woman that you gave me the book the teachers
know the man she wrote it for.' (Tuller, 1986, 84)

Synopsis

- ▶ Partial overlap between resumption and gap type extraction
 - ▶ Resumption only:
 - ▶ Possessors
 - ▶ Complements of true prepositions
 - ▶ Gap-only:
 - ▶ Extraction of non-NP complements
 - ▶ Adjunct extraction
 - ▶ Both:
 - ▶ indirect objects
 - ▶ human direct objects
- ▶ Gaps and resumptives found in
 - ▶ wh- and focus fronting
 - ▶ relativisation
- ▶ Resumptives and gaps can foot the same UDC (e.g. with ATB)
- ▶ Extraction out of strong islands:
 - ▶ top of the dependency restricted to relatives
 - ▶ bottom restricted to resumptives

SLASH dependencies in HPSG

- ▶ Tri-partite non-local dependencies:
 - ▶ SLASH introduction at gap site (lexical)
 - ▶ SLASH percolation (head-driven)
 - ▶ SLASH retrieval (lexical/constructional)



SLASH passing in HPSG

- ▶ Unbounded dependencies in HPSG are mediated via a non-local set-valued feature SLASH, relating properties of the filler to properties at the gap site
- ▶ Following Sag (1997); Ginzburg & Sag (2000), SLASH passing is
 - ▶ lexical:
gaps are introduced on the argument structure of the head
 - ▶ head-driven:
heads determine their SLASH value from those of their arguments

(21) SLASH amalgamation (Ginzburg & Sag, 2000)

$$\left[\begin{array}{l} \text{SYNSEM} \left[\text{NLOC} \left[\text{SL } \boxed{1} \cup \dots \cup \boxed{n} \right] \right] \\ \text{ARG-ST} \left\langle \left[\text{NLOC} \left[\text{SL } \boxed{1} \right] \right], \dots \left[\text{NLOC} \left[\text{SL } \boxed{n} \right] \right] \right\rangle \end{array} \right]$$

Resumption in HPSG

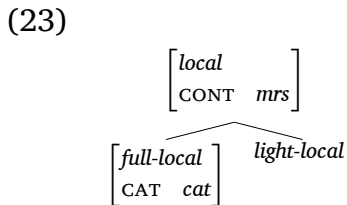
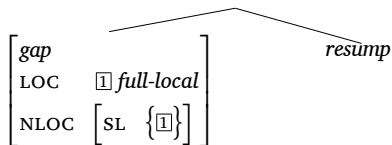
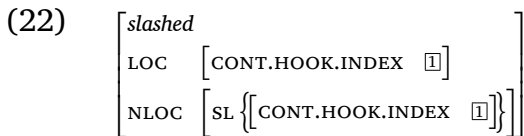
- ▶ Most HPSG practitioners (Alotaibi & Borsley, 2013; Taghvaipour, 2005; Crysmann, 2012) agree, based on ATB facts, that resumption should be regarded as a SLASH dependency
- ▶ HPSG scholars disagree as to whether resumptive and gap dependencies need to be distinguished by other means
 - ▶ Borsley (2010) and Alotaibi & Borsley (2013) do not draw any distinction between resumptive and gap dependencies
Island effects considered extra-grammatical
 - ▶ Taghvaipour (2005) percolates UDC type in addition to *local* values
 - ▶ Crysmann (2012) implements a weight distinction to capture difference w.r.t. island effects
weight distinction similar to complement vs. relative clause extraposition (Crysmann, 2013)

Alotaibi & Borsley (2013); Borsley (2010)

- ▶ Resumptive dependencies analysed as SLASH dependencies coindexing an element of a lexical head's SLASH with the INDEX of an argument
 - ▶ resumptive arguments are not themselves slashed
 - ▶ modified version of SLASH amalgamation: elements of SLASH may correspond to an argument's SLASH, or to the INDEX of an unslashed argument
- ▶ Pro:
 - ▶ Treats resumptive pronouns as ordinary pronouns
- ▶ Cons:
 - ▶ Fails to assign proper semantics for resumptive use: more than one relation per variable
 - ▶ Replaces deterministic SLASH amalgamation with a non-deterministic, massively disjunctive constraint
 - ▶ Fails to capture island effects in Hausa

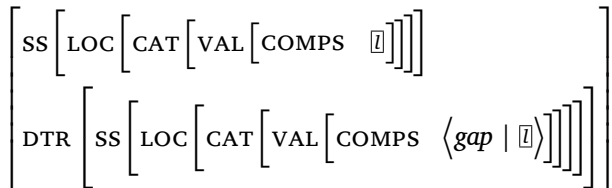
Crysmann (2012, 2015): Island sensitivity

- ▶ ATB suggests resumptives and gaps are compatible
- ▶ Hausa island effects show that
 - ▶ only relatives footed by a resumptive can escape islands
 - ▶ both gap dependencies and phrasal fillers are island-sensitive
- ▶ Distinguish gaps/resumptives and wh/relatives by the amount being minimally shared
 INDEX (resumptive, relative) vs. LOC (gap, wh-filler)



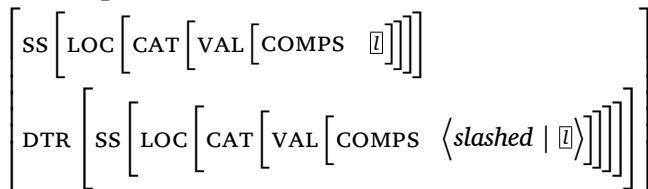
Crysmann (2012, 2015): Launching SLASH

- ▶ Standard gap-type dependencies are introduced by CELR
 - ▶ Full reentrancy of SL element with a dependent's LOC value
- (24) Complement extraction (e.g. human direct object)



- ▶ Lexical rules for resumption are crucially underspecified: compatible with both wh fillers and relative dependencies

(25) Resumption



Crysmann (2012, 2015): SLASH retrieval

- ▶ Two constructions for retrieval in Hausa:
 - ▶ classic filler-head structures (for wh- and focus fronting) identifies TO-BIND.SLASH with filler's entire LOC value

$$(26) \left[\begin{array}{l} \text{filler-head-rule} \\ \text{F-DTR} \quad \left[\text{SS|LOC} \quad \boxed{i} \right] \\ \text{HD-DTR} \quad \left[\text{SS|NLOC} \quad \left[\text{T-B|SLASH} \left\{ \boxed{i} \right\} \right] \right] \end{array} \right]$$

- ▶ relative complementiser identifies index in TO-BIND.SLASH with index of antecedent noun (in REL)

$$(27) \left[\begin{array}{l} \text{rel-complementiser-lex} \\ \text{SS} \quad \left[\text{LOC|CAT|HEAD|MOD|LOC|CONT|INDEX} \quad \boxed{i} \right] \\ \text{HD-DTR} \quad \left[\text{SS|NLOC} \quad \left[\text{T-B|SLASH} \left\{ \left[\text{CONT|INDEX} \quad \boxed{i} \right] \right\} \right] \right] \end{array} \right]$$

- ▶ Strong Island constraint:

$$(28) \left[\text{HD-DTR|SS|NLOC|T-B|SLASH} \left\{ \left[\quad \right] \right\} \right] \rightarrow \left[\text{SS|NLOC|SLASH} \quad \text{set}(\text{light-local}) \right]$$

Summary of the baseline approach

▶ Features

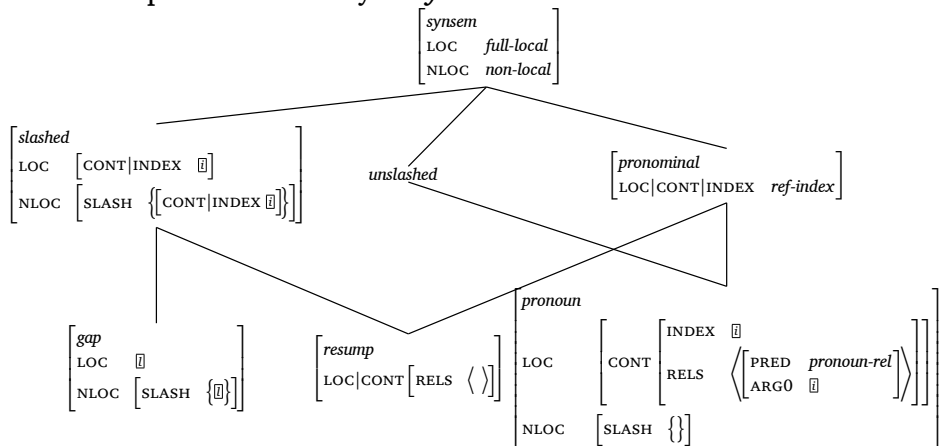
- ▶ Captures overlap between gap and resumptive strategies in Hausa
- ▶ Accounts for islands
- ▶ Semantics:
 - ▶ correctly distinguishes resumptives and ordinary pronouns
 - ▶ no spurious differences between gaps and resumptives

▶ Bugs

- ▶ Duplication of
 - ▶ pronominal lexical items
 - ▶ pronominal affixation rules
 - ▶ zero pronoun rules
- ▶ Misses McCloskey's generalisation:
in languages with resumption, resumptives are always the ordinary pronouns of the language

Resumption by underspecification

- ▶ Synthesis:
 - ▶ decision on function is property of governing head (cf. Borsley)
 - ▶ combine with underspecification of *pronominal-synsem* (generalises across bound and free pronouns)
 - ▶ Expanded hierarchy of *synsem*



Argument realisation

- ▶ Two-ways distinction
 - ▶ local vs. nonlocal
 - ▶ mode of expression (zero/affix/word)
- ▶ Decision on locality of realisation decided on governing head (cf. Borsley)
 - ▶ Obligatory LR layer on nouns, verbs, and prepositions to disambiguate direct object (first member on COMPS) for *slashed* or *unslashed* realisation
 - ▶ Analogous LRs on TAM/AGR markers for SUBJ
- ▶ Mode of expression distributed over
 - ▶ heads (zero/affix)
 - ▶ dependents (word)

Unifying property: *synsem* values

- ▶ Unification of locality and expression *synsem* types yields pronoun vs. resumptive readings (SLASH and semantics)

Adjuncts

- ▶ Current approach capitalises on privileged complement status
- ▶ Two remaining issues:
 - ▶ resumptives contained within adjuncts
 - ▶ resumptive adjuncts
- ▶ Resumptives contained within adjuncts
 - ▶ complement resumptives readily licensed by local head
 - ▶ adjuncts known to be permeable for index percolation, e.g. with relative extraposition (Kiss, 2005; Crysmann, 2013)
 - ▶ exceptional SLASH passing out of adjuncts attested by parasitic gaps (Pollard & Sag, 1994)
- ▶ Adjunct resumptives?
 - ▶ Hausa exclusively relies on gap type extraction for adjuncts
 - ▶ Coptic lacks complement gaps altogether, yet features gap-type extraction with adjuncts (Crysmann & Reintges, 2014)
 - ▶ Asymmetry expected, if adjunct extraction is syntactic (Levine, 2003), but complement extraction lexical

The place of island constraints

- ▶ Borsley (2010) and Alotaibi & Borsley (2013) attribute island effects (and lack thereof) to performance, citing Hofmeister & Sag (2007)
 - ▶ Hofmeister & Sag (2007), however, do not address resumption
 - ▶ Alexopoulou & Keller (2007) show on the basis of English, German, and Greek that resumptives
 - ▶ improve acceptability without island violations (deep nesting)
 - ▶ improve acceptability with weak islands (*that/whether* clauses)
 - ▶ do **not** improve acceptability with **strong** islands (e.g. relatives)

Clear-cut difference between strong and weak islands is explicitly related to grammar/performance distinction

- ▶ Hausa island effects
 - ▶ involve **strong** islands (wh and relative clauses)
 - ▶ difference between relative/resumptive vs. wh-filler or gap chains must be part of grammar

HaG sample analyses <http://hag.delph-in.net/logon>

halima ce muka kawo mata kif	Mun kawo mata kif
<p>Close Close All Print Show chart Compare</p>	<p>Close Close All Print Show chart Compare</p>
<p>Close Close All Print</p> <pre> (e3: x5:named<0:6>("Hällimà")(x PERS 3, NUM sg, GEND f, COG-ST uniq-id)[] e6:_ne-ce_d_exh<7:9>(e)[ARG1 x5] _1:unspec_q<0:9>[BV x5] x11:pron<10:14>(x PERS 1, NUM pl, COG-ST in-foc)[] _2:pronoun_q<10:14>[BV x11] e3:_kaawoo_v_gr6-bring<15:19>(e TAM perfective)[ARG1 x11, ARG2 x15] e16:_wà_v_applic<20:24>(e)[ARG1 e3, ARG2 x5] x15:_kiifii_n_fish<25:29>(x PERS 3, NUM sg, GEND m)[] _3:unspec_q<25:29>[BV x15] e21:focus_d<0:9>(e)[ARG1 e3, ARG2 x5] } </pre>	<p>Close Close All Print</p> <pre> (e3: x5:pron<0:3>(x PERS 1, NUM pl, COG-ST in-foc)[] _1:pronoun_q<0:3>[BV x5] e3:_kaawoo_v_gr6-bring<4:8>(e TAM completive)[ARG1 x5, ARG2 x9] e11:_wà_v_applic<9:13>(e)[ARG1 e3, ARG2 x10] x10:pron<9:13>(x PERS 3, NUM sg, GEND f, COG-ST in-foc)[] _2:pronoun_q<9:13>[BV x10] x9:_kiifii_n_fish<14:18>(x PERS 3, NUM sg, GEND m)[] _3:unspec_q<14:18>[BV x9] } </pre>
<p>Close Close All Print</p> <p>Hällimà céé múká kááwóó mätä kíifii Hällimà céé múká kááwóó wà kíifii</p>	<p>Close Close All Print</p> <p>Mún kááwóó mätä kíifii</p>

UDCs

Pronoun

Conclusion

- ▶ Underspecification approach
 - ▶ provides an account of McCloskey's generalisation, in contrast to Crysmann (2015):
 - ▶ single lexical entry/morphological rule for pronominals
 - ▶ differentiation of function on governing head
 - ▶ assigns identical semantics to resumptives/gaps, in contrast to
 - ▶ Alotaibi & Borsley (2013): no treatment of semantics, leading to “resource surplus”
 - ▶ Asudeh (2004): extra glue manager resource to cope with “resource surplus”
 - ▶ contextually differentiates semantics of resumptive vs. pronominal use
 - ▶ keeps standard deterministic SLASH amalgamation
 - ▶ integrates with grammatical account of island effects in Hausa
 - ▶ fully implemented in DELPH-IN (LKB/Pet/ace)

Shi ke nan. Kurunkus.

References I

- Alotaibi, Mansour & Robert D. Borsley. 2013. Gaps and resumptive pronouns in Modern Standard Arabic. In Stefan Müller (ed.), *Proceedings of the 20th international conference on head-driven phrase structure grammar, freie universität berlin*, 6–26.
<http://cslipublications.stanford.edu/HPSG/2013/alotaibi-borsley.pdf>.
- Asudeh, Ash. 2004. *Resumption as resource management*: Stanford University dissertation.
- Borer, Hagit. 1984. Restrictive relatives in Modern Hebrew. *NLLT* 2. 219–260.
- Borsley, Robert D. 2010. An HPSG approach to Welsh unbounded dependencies. In Stefan Müller (ed.), *Proceedings of the 17th international conference on head-driven phrase structure grammar, université paris diderot, paris 7, france*, 80–100. Stanford, CA: CSLI Publications.
<http://cslipublications.stanford.edu/HPSG/2010/borsley.pdf>.
- Crysmann, Berthold. 2012. Resumption and island-hood in Hausa. In Philippe de Groote & Mark-Jan Nederhof (eds.), *Formal grammar. 15th and 16th international conference on formal grammar, fg 2010 copenhagen, denmark, august 2010, fg 2011 ljubljana, slovenia, august 2011*, vol. 7395 Lecture Notes in Computer Science, 50–65. Springer.
- Crysmann, Berthold. 2013. On the locality of complement clause and relative clause extraposition. In Gert Webelhuth, Manfred Sailer & Heike Walker (eds.), *Rightward movement in a comparative perspective*, 369–396. Amsterdam: John Benjamins.
- Crysmann, Berthold. 2015. Resumption and extraction in an implemented hpsg of hausaland. In *Proceedings of the acl-ijnlp workshop on grammar engineering across frameworks (geaf-2015), beijing, china*, ACL.

References II

- Crysmann, Berthold & Chris H. Reintges. 2014. The polyfunctionality of coptic egyptian relative complementisers. In Stefan Müller (ed.), *Proceedings of the 21st international conference on head-driven phrase structure grammar, university of buffalo*, 63–82. Stanford: CSLI publications.
- Ginzburg, Jonathan & Ivan A. Sag. 2000. *Interrogative investigations. the form, meaning, and use of english interrogatives*. Stanford: CSLI Publications.
- Jaggar, Philip. 2001. *Hausa*. Amsterdam: John Benjamins.
- Kiss, Tibor. 2005. Semantic constraints on relative clause extraposition. *Natural Language and Linguistic Theory* 23. 281–334.
- Levine, Robert D. 2003. Adjunct valents: cumulative scoping adverbial constructions and impossible descriptions. In Jongbok Kim & Stephen Wechsler (eds.), *The proceedings of the 9th international conference on head-driven phrase structure grammar*, 209–232. Stanford: CSLI Publications. <http://csli-publications.stanford.edu/HPSG/3/>.
- McCloskey, J. 1990. Resumptive pronouns, a'-binding and levels of representation in Irish. In R. Hendrick (ed.), *The syntax of the modern celtic languages*, vol. 23 Syntax and Semantics, Academic Press.
- Newman, Paul. 2000. *The Hausa language. an encyclopedic reference grammar*. New Haven, CT: Yale University Press.
- Pollard, Carl & Ivan A. Sag. 1994. *Head-driven phrase structure grammar*. Chicago: University of Chicago Press.
- Sag, Ivan. 1997. English relative clause constructions. *Journal of Linguistics* 33(2). 431–484. <ftp://ftp-csli.stanford.edu/linguistics/sag/rel-pap.ps.gz>.

References III

- Taghvaipour, Mehran. 2005. *Persian relative clauses in Head-driven Phrase Structure Grammar*. University of Essex dissertation.
- Tuller, Laurice A. 1986. *Bijjective relations in Universal Grammar and the syntax of Hausa*. Ann Arbor: UCLA dissertation.