An underspecification approach to Hausa resumption

Berthold Crysmann
Laboratoire de linguistique formelle, CNRS and U Paris-Diderot

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Abstract

Within recent work on the treatment of resumption in HPSG, there is growing consensus that resumptive unbounded dependency constructions (=UDCs) should be modelled on a par with gap-type UDCs (Alotaibi and Borsley, 2013; Borsley, 2010; Crysmann, 2012b; Taghvaipour, 2005), using a single feature SLASH for both types of dependencies, rather than separate features, as proposed by Vaillette (2001a,b). Yet, authors disagree as to where exactly in the grammar the resumptive function of pronominals should be established: while Crysmann (2012b, 2015) advances an ambiguity approach that has pronominal *synsem* objects being ambiguous between a resumptive and an ordinary pronoun use, Borsley (2010); Alotaibi and Borsley (2013), by contrast, treat all pronominals, resumptive or not, as ordinary pronouns and effect their resumptive use by means of tailoring the SLASH amalgamation principle to potentially include pronominal indices. While their decision provides a straightforward account of McCloskey's generalisation that resumptives always look like the ordinary pronouns of the language, it fails to capture the difference in semantics between ordinary pronominal and resumptive uses.

In this paper, I shall reexamine the evidence from Hausa and propose to synthesise the approaches put forth by Alotaibi and Borsley (2013) and Crysmann (2012b), and propose that the potential for pronominal and resumptive function (including their difference w.r.t. semantics and non-local features) is captured by means of underspecification, yet the decision as to canonical vs. non-canonical use is made at the level of the governing head (Borsley, 2010; Alotaibi and Borsley, 2013). I shall argue that this division of labour is sufficient to derive the correct gap-like semantics for resumptives, maintains standard deterministic SLASH amalgamation, and, finally, provides an answer to McCloskey's generalisation.

1 Gaps and resumptives in Hausa

Unbounded dependency constructions in Hausa provide evidence for both gap and resumptive strategies in the grammar of extraction. Hausa employs a resumptive strategy with extraction of possessors or complements of prepositions. As shown in (1), possessor resumptives are realised as bound pronominal affixes, whereas true prepositions make use of the independent pronoun set. Use of a gap strategy is illicit in either of these constructions.

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(1) a. wȁ ka àuri 'ya *(-r -sà) ?
who 2.M.CMPL marry daughter(F) -of.F -3.S.M
'Whose daughter did you marry?' (Jaggar, 2001)

b. sàndā sukà dȍkē shì dà *(ita)
stick 3P.CPL beat 3S.DO with 3S.F
'It was a stick they beat him with.' (Jaggar, 2001)

As witnessed in (2), indirect objects display overlap between the two strategies, i.e. both gaps and resumptives may be used in principle. Again, the resumptive is a pronominal affix fused with the indirect object marker.

(2) mutȁnên dà sukà ƙi sayar musù / wà Ø dà àbinci sukà fìta
men REL 3.P.CPL refuse sell to.them / to with food 3.P.CPL left
'the men they refused to sell food to left.' (Jaggar, 2001)

Human direct objects show a clear preference for zero realisation (Newman, 2000), at least with very short extractions.

(3) Gȁ yārinyàr$_i$ dà ka sanī Ø$_j$ / ??san tà$_i$
here.is girl REL 2.S.F.CPL know / know her
'Here's the girl that you know.'

However, with extraction out of embedded clauses, both gaps and overt resumptives appear equally acceptable, as illustrated in (4).

(4) mùtumìn$_i$ dà ɗȁlìbai sukà san [cȇwā mālàma-r-sù tanȁ
man REL students 3P.CPL know COMP teacher-L.F-3P.GEN 3.S.F.CONT
sô-n-sà$_i$ / sô Ø$_i$]
like.VN-L-3.S.M.GEN / like.VN
'the man that the students know that their teacher likes' (Newman, 2000, 539)

Similarly, as shown in (16) and (17) below, resumptives are also attested for human direct objects with ATB extraction.

However, with extraction out of strong islands, e.g. relative clauses, use of an overt resumptive becomes obligatory, both for indirect (5) and human direct objects (6).

(5) Gȁ tābōbîn$_j$ dà Àli ya san mùtumìn$_i$ dà Ø$_i$ zâi yī
here.is cigarettes REL Ali 3.S.M.CPL know man REL 3.S.M.FUT do
musù$_j$ / *wà Ø$_j$ kwālī
to.them / to Ø box
'Here are the cigarettes that Ali knows the man that (he) will make a box for.' (Tuller, 1986)

(6) Gà mùtumìn$_j$ dà ka ga yārinyàr$_i$ dà $\emptyset_i$ ta san shì$_j$ /
here.is man REL 2.S.M.CPL see girl REL 3.S.F.CPL know him /
*sanī $\emptyset_j$
know
'Here's the man that you saw the girl that knows.' (Tuller, 1986)

Turning to non-human direct objects, Hausa observes an intricate interaction with argument drop: as shown by the contrasts below, non-human direct objects (7) permit argument drop, whereas human direct objects do not (8). Subjects in Hausa equally undergo argument drop, as shown by the presence vs. absence of a lexical subject in examples (4) and (2) above.

(7) a. Kā ga littāfì-n Mūsa?
2S.M.CPL see book-of Musa
'Did you see Musa's book?'
b. Ī, nā gan shì. / Ī, nā ganī $\emptyset$
Yes 1.S.CPL see 3S.M Yes 1.S.CPL see
'Yes, I saw it.' (Tuller, 1986, 61)

(8) a. Kā ga ƙanè-n Mūsa?
2S.M.CPL see brother-of Musa
'Did you see Musa's brother?'
b. Ī, nā gan shì. / *Ī, nā ganī $\emptyset$
Yes 1.S.CPL see 3S.M Yes 1.S.CPL see
'Yes, I saw him.' (Tuller, 1986, 62)

As argued by Tuller (1986), Hausa permits long relativisation without an overt resumptive in exactly those cases where the language independent licenses pro-drop, i.e. for subjects (9) and non-human direct objects (10).

(9) mùtumìn$_i$ dà ka san littāfìn$_j$ dà $\emptyset_i$ ya rubùtā $\emptyset_j$
man REL 2S.M.CPL know book REL 3S.M.CPL write
'the man that you know the book (he) wrote' (Tuller, 1986)

(10) littāfìn$_i$ dà ka san mùtumìn$_j$ dà $\emptyset_j$ ya rubùtā $\emptyset_i$
book REL 2S.M.CPL know man REL 3S.M.CPL write
'the book that you know the man who wrote (it)' (Tuller, 1986)

The possibility for long relativisation out of strong islands generalises from relative clauses to wh-islands, as shown in

(11) mùtumìn$_i$ dà ka san [mȅ$_j$ $\emptyset_i$ ya rubùtā $\emptyset_j$]
man REL 2S.M.CPL know what 3S.M.CPL write
'the man that you know what (he) wrote' (Tuller, 1986, 80)

(12) littāfìn$_i$ dà ka san [wà̀$_j$ ∅$_j$ ya rubù̀tā ∅$_i$]
book REL 2S.M.CPL know who 3S.M.CPL write
'the book that you know who wrote (it)' (Tuller, 1986, 80)

Note, however, that while long relativisation out of relatives and embedded wh-clauses is possible, long wh-extraction out of these islands is not. This holds for both subjects (13) and direct objects (14).

(13) * wànè mùtûm$_i$ ka bā nì littāfìn$_j$ dà ∅$_i$ ya rubù̀tā ∅$_j$
which man 2S.M.CPL give me book REL 3S.M.CPL write
'Which man did you give me the book that wrote' (Tuller, 1986, 81)

(14) * wànè littāfì$_j$ ka san wà̀$_i$ ∅$_i$ ya rubù̀tā ∅$_j$
which book 2S.M.CPL know who 3S.M.CPL write
'which book do you know who wrote' (Tuller, 1986, 80)

Furthermore, where an overt resumptive is required in situ, its presence has no effect on the acceptability of long wh extraction (cf. (15)).

(15) a. wà̀$_j$ ka yi màganà̀ dà shī$_j$
who 2S.M.CPL do talking with 3S.M
'Who did you talk with?' (Tuller, 1986, 158)

b. * wà̀$_j$ ka san mà̀târ$_i$ [dà ∅$_i$ ta yi màganà̀ dà shī$_j$]
who 2S.M.CPL know woman REL 3S.F.CPL do talking with 3S.M
'Who do you know the woman that talked to him' (Tuller, 1986, 159)

Hausa permits mixing of gap and resumptive strategies in ATB extraction, as shown in (16):

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

(17) mùtumìn$_i$ dà na bā shì$_i$ aro-n bàrgō-nā àmmā
man REL 1.S.CPL give 3.S.M.DO lending-L blanket-L.1.S.G but
duk dà hakà ∅$_i$ yakè jî-n sanyī
in spite of that ∅ 3.S.M.CONT feel-L cold
'the man whom I lent my blanket but who still felt cold' (Newman, 2000)

This observation suggests that resumptive and gap strategies should be compatible in principle.

As stated above, resumptive function in Hausa is independent of the mode of realisation: it is equally attested with independent pronouns, found with e.g. true prepositions, bound pronominals and even zero pronouns. There are in principle two ways

to capture this generalisation: either one can assimilate the syntactic representation of zero-pronominals and pronominal affixes to that of independent pronouns by postulating a phonetically empty pronominal in syntax (*pro*), as assumed widely in Transformational Grammar, or else one can make the representation of resumptives independent of the lexical sign, and represent it instead on the argument structure of the governing head. Fortunately, the language provides the necessary evidence to choose among the two options: Hausa verbs (and nouns, for that matter) inflect according to the mode of realisation of direct object complements (Parsons, 1960; Crysmann, 2005), establishing a maximally three-fold distinction between (i) phrasal complements in situ (18a), (ii) pronominal affixes (18b), and (iii) non-realisation, which includes gaps (18c), intransitives, and object pro-drop (18d).

(18) a. nā ga/*gan/*ganī àbōkī-nā
1s.CMPL see.C friend-POSS.1.SG
'I saw my friend.'

b. nā gan/*ga/*ganī -shì
1s.CMPL see.B -3s.M
'I bought/read it.'

c. àbōkī dà na ganī
friend-POSS.1.SG REL 1s.CMPL see.A
'the friend that I saw'

d. nā ganī
1s.CMPL see.A
'I bought/read it/*him/*her .'

If pronominal affixation, pro-drop and extraction equally involve valence reduction, a unified account follows directly. However, any account that relies on the presence of a phonetically null pronominal to model resumption with object drop will end up making the wrong prediction w.r.t. verbal inflection. Moreover, since frame alternation is arguably a lexical process the difference between zero and non-zero NP complements will not be detectable on the verb's valence lists (which specify *synsem* objects, to the exclusion of PHON and DTRS).

Synopsis

To summarise the main points of the empirical patterns, we observed that Hausa witnesses both resumption and gap strategies, showing considerable overlap in their use: in principle, both gaps and resumptives can foot long distance dependencies, independently of whether we are dealing with relativisation or rather wh/focus fronting. This functional similarity is further confirmed by the compatibility of gaps and resumptives in ATB extraction. Once island constraints come into play, however, we observe a marked contrast: while wh extraction and focus fronting may never escape strong islands, relativisation is island-insensitive, provided a resumptive at the bottom

of the dependency. Typologically, this is an interesting finding: depending on the type of unbounded dependency construction, Hausa resumptives may either pattern with gaps (wh extraction), or rather show a markedly distinct behaviour (relativisation). In the terminology of Asudeh (2011, 2012), Hausa resumptives are of the syntactically active type, as far as relativisation occurs, thus patterning with Hebrew, yet of the syntactically inactive type, once we consider wh extraction (cf. e.g. Vata).

2 Analysis

2.1 Resumption in HPSG

HPSG practitioners working on resumption (Alotaibi and Borsley, 2013; Taghvaipour, 2005; Crysmann, 2012b) currently agree that this unbounded dependency should be analysed on a par with gap-type dependencies in terms of a non-local dependency, uniformly represented by means of SLASH feature percolation. In contrast to previous work by Vaillette (2001a,b), use of a single feature for both types of non-local dependency facilitates the analysis of ATB extraction where a single filler can be terminated simultaneously by a gap in one conjunct and a resumptive in the other.

Where views differ, however, is whether or not these two types of non-local dependencies should be differentiated by other means. On one side of the spectrum, Borsley (2010) and Alotaibi and Borsley (2013) categorically deny the need to distinguish resumptive and gap type dependencies along the SLASH percolation path, arguing that, e.g. island effects should be attributed to performance, rather than competence. See, however, section 3.2 for critical discussion of this claim.

On the other end of the spectrum, Taghvaipour (2005) proposes an elaborate system whereby information about the top of the unbounded dependency construction, differentiating wh-fillers from ordinary and free relatives, is passed down via SLASH, alongside the filler's LOCAL value, which enables him to account for the distribution of gaps and resumptives in Persian in a fine-grained way depending on properties of the construction the filler is in. However, his partitioning according to dependency type (wh filler vs. free relative vs. ordinary relative) fails to make the right distinctions to account for island effects in Hausa.

My own previous proposal (Crysmann, 2012b) roughly covers the middle ground between the two aforementioned perspectives, permitting some degree of differentiation on SLASH values, while abstaining from a full-blown encoding of construction-specific features. Rather, I distinguish members of SLASH with respect to the minimum amount of information to be percolated, which is minimally a referential index (for relatives/resumptives), or a full *local* value (for wh-fillers/gaps), a distinction I have previously employed to account for difference in locality with complement clause vs. relative clause extraposition in German (Crysmann, 2013).

I shall now briefly sketch the proposals by Borsley (2010) and Crysmann (2012b, 2015), assess their respective advantages and shortcomings, and, subsequently, propose a synthesis of the two lines of analysis that combines their strengths while minimising the weaknesses.

2.1.1 Borsley (2010); Alotaibi and Borsley (2013)

In their analyses of resumption in Welsh and Arabic, Borsley (2010) and Alotaibi and Borsley (2013) follow McCloskey (2002) and argue that the morphological identity of resumptives to their non-resumptive pronominal counterparts militates against an approach in terms of lexical ambiguity. Instead, they suggest that resumptive are just the ordinary pronouns of the language, i.e. they do not launch a non-local dependency by themselves. In order to capture the ATB facts and to relate the pronoun to the non-local filler (wh/topicalisation) or the antecedent noun (relativisation), they suggest to effect the resumptive function on the governing head. To this end, they revise the principle of lexical SLASH amalgamation (Ginzburg and Sag, 2001) to optionally introduce an element into SLASH whose INDEX is structure-shared with that of a pronominal argument. While this approach correctly launches the non-local dependency without having to postulate lexical ambiguity between resumptive and ordinary pronouns, it fails to provide an account of the difference in semantics between resumptive and ordinary pronoun uses: as a result, resumptive use will end up having the same argument role be instantiated simultaneously by the pronoun at the bottom of the dependency, and by the relation contributed by the filler, at the top of the dependency. Furthermore, their revision of SLASH amalgamation turns an originally deterministic constraint into a non-deterministic one.

As we have seen in our discussion of the Hausa facts, resumption and gap-type extraction differ crucially with respect to island effects. In order to exert tight control on the distribution of gaps vs. resumptives it appears necessary to distinguish non-local dependencies with a gap at the foot from resumptive ones. Faced with a similar situation in Modern Standard Arabic, Alotaibi and Borsley (2013) exploit case to achieve this goal. However, this approach will not scale up to Hausa, since case is essentially unattested in the syntax of this primarily head-marking language.

2.1.2 Crysmann (2012b, 2015)

Just like Alotaibi and Borsley (2013), Crysmann (2012b) takes the ATB facts as evidence to model both gap and resumptive dependencies via a single set-valued feature SLASH. However, in order to capture the difference w.r.t. island-sensitivity, I distinguished the elements of this set as to whether they are full *local* values (wh- and focus fronting) or rather impoverished *local* values, minimally containing INDEX information (cf. Figure 2.1.2). In essence, resumption is likened to an obligatory anaphoric process under this perspective (see Asudeh, 2011, 2012 and Sells (1984) for similar intuitions). In contrast to Alotaibi and Borsley (2013), however, constraints on weight can be imposed along the SLASH percolation path, offering a way to capture difference in island sensitivity, as detailed by the constraints regarding *weak-local* SLASH values in Figures 3 and 4.

At the bottom of the dependency, gaps enforce reentrancy with SYNSEM.LOC, coercing the element in SLASH to *full-local*, whereas resumptives only observe a minimal requirement for INDEX-sharing, thus being compatible with both relatives and

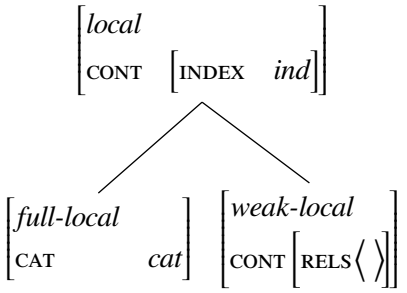


Figure 1: Hierarchy of *local*

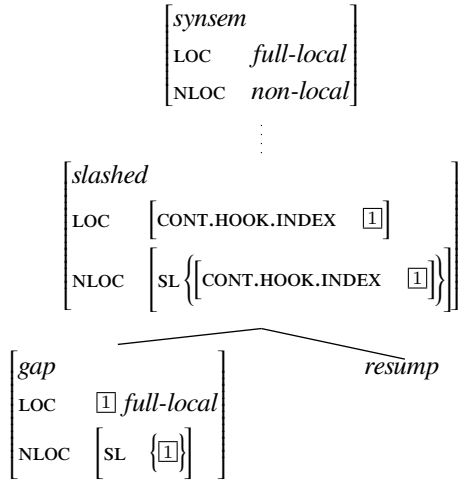


Figure 2: Hierarchy of synsem objects

wh-fronting, as shown in Figure 2.1.2. To generalise across bound and free pronominals, Crysmann (2012b) introduced disjunctive SLASH values for pronominal *synsem* objects. The implementation of this theory in Crysmann (2015), which also captures the semantic differences between resumptives and ordinary pronouns, employed lexical ambiguity. This not only led to doubling the number of lexical items for pronouns and pronominal affixation rules, but also failed to provide an account of McCloskey's generalisation, a rather sub-optimal solution.

At the top of the dependency, filler-head structures (Figure 3) impose full sharing of the filler's local value with an element in SLASH, thereby coercing this element's type to *full-local*. Relative complementisers (Figure 4), however, are content with index sharing, thus no coercion regarding the *local* sub-type will take place.

On the upside, the approach incorporated a treatment of island effects. To this end, retrieval sites, such as head-filler structures and relative complementisers constrain the set of SLASH values they pass on to be of the weaker anaphoric type. Since fillers and gaps are standardly subject to full sharing of local values, it follows that island effects ensue whenever a SLASH dependency features a gap at the bottom, or a filler at the top, i.e. only relatives footed by a resumptive are compatible with the con-

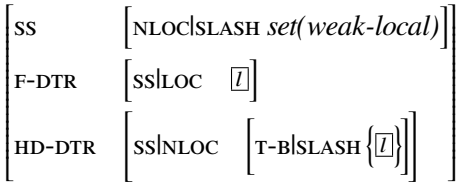


Figure 3: Filler-Head rule

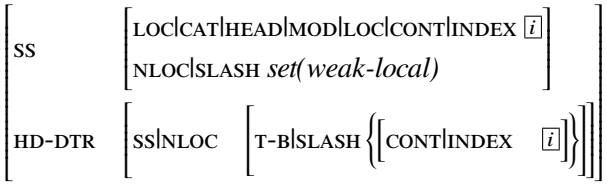


Figure 4: Relative complementiser

straint regarding *weak-local* , since neither end enforces full reentrancy, and therefore can escape islands. For illustration, consult the constraints imposed by head-filler structures and relative complementisers in Figures 3 and 4: since both relatives and head-filler structures (wh/focus fronting) are only transparent to *weak-local*, only those unbounded dependencies can cross where neither the top, nor the bottom of the dependency coerces the relevant SLASH element to full sharing. Finally, note that resumptives are not pretyped to *weak-local* (cf. Figure 2.1.2), but rather underspecified: thus, they are still compatible with *full-local* fillers, as long as no island constraints are imposed along the path.

2.2 A synthesis

In order to overcome the motivational problems associated with an ambiguity approach, I shall synthesise the respective proposals by Borsley and Crysmann. In essence, I propose that the potential to launch a non-local dependency vs. having pronoun semantics should be captured by way of underspecification. The decision on slashed realisation, however, is imposed on the argument structure of the governing head. As a net effect, this approach captures the semantic difference between ordinary pronominal and resumptive uses, keep the original deterministic formulation of SLASH amalgamation, and provide an explanation of McCloskey's generalisation.

To this end, I shall refine, in a first step, the type hierarchy of *synsem* objects along the lines of Figure 5. In essence, I propose a primary distinction between slashed and unslashed realisation, the former of which comprises *gap* and purely resumptive subtypes. Orthogonal to this distinction, I introduce pronominal synsem objects, which may resolve to either unslashed ordinary pronouns or slashed resumptives.

Having an underspecified common super-type for resumptive and ordinary pronoun uses directly avoids disjunctive specification in the representation of pronominals, regardless of whether they are free, bound or zero. Syntactic and semantic

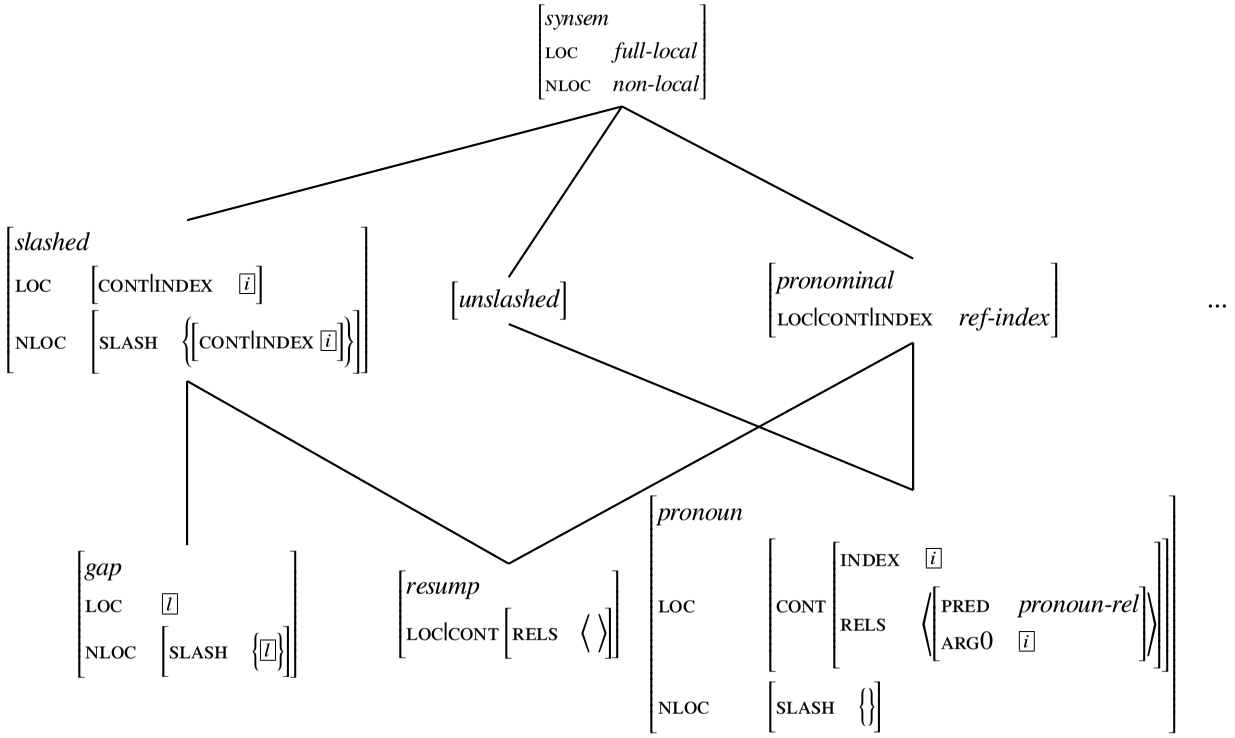


Figure 5: Hierarchy of synsem objects

differences are captured as latent constraints on the sub-types: if unslashed realisation is chosen, *pronominal(-synsem)* is specialised to *pronoun(-synsem)*, applying all constraints associated with this type (empty SLASH and non-empty semantics). If, by contrast, slashed realisation is chosen, *pronominal(-synsem)* is specialised to *resump*, enforcing a non-empty SLASH, yet empty semantics. Note that the constraints associated with *resump* only require minimal INDEX-sharing, following previous proposals by both Borsley and Crysmann.

Incorporating insights from Borsley, the ultimate decision on realisation type is associated with the governing head, i.e. crucially external to the pronominal itself: using a pair of lexical rules each, direct object (and subject) valencies are segregated into *slashed* and *unslashed*, i.e. the subject and the first complement are specialised to one of these two *synsem* sub-types.[1] Subsequent lexical rules of pronominal affixation or zero pronominal realisation have the desired effects owing to the intersection of types pertaining to the *slashed/unslashed* distinction with those relating to pronominal status. Similarly, syntactic combination with a free pronoun will result in either resumptive (*slashed* ∧ *pronominal* = *resump*) or ordinary pronominal use (*unslashed* ∧ *pronominal* = *pronoun*). Thus, in contrast to Crysmann (2015), this approach only ever needs a single pronominal affixation rule for any cell of the paradigm, or else a single lexical entry for each independent pronoun.

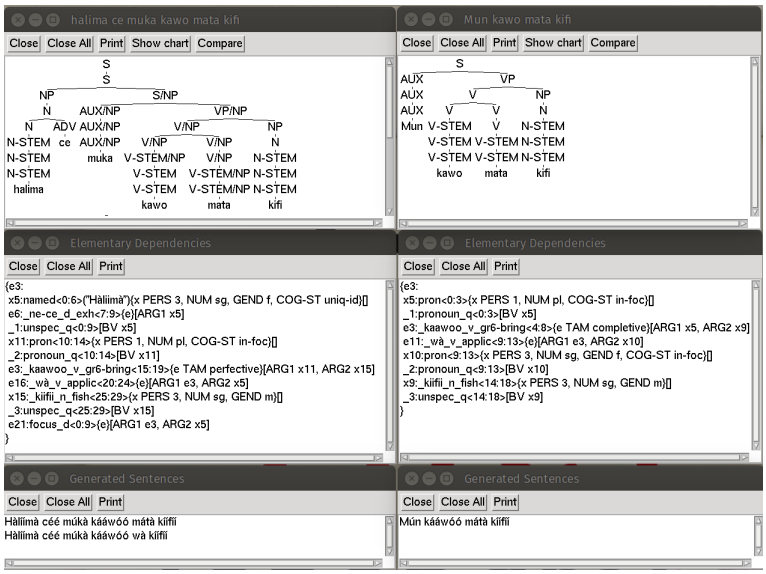
Given that pronominal arguments under the current account provide for the possibility of being slashed or not (in contrast to Borsley), standard HPSG SLASH amalgamation and head-driven propagation of NON-LOCAL features will ensure proper launching and percolation of gap and resumptive dependencies alike.

The synthesis of Crysmann and Borsley seamlessly integrates with the weight-based theory of island effects developed in my previous works. Since all I do here is relocate the decision between slashed and unslashed realisation from the dependent onto the governing head, the distinction between minimal sharing (for resumptives) and full sharing (for gaps) is fully maintained in the *synsem* type hierarchy. Together with the associated consequences regarding the weight of local values on SLASH, the selective transparency of islands for *weak-local* applies unmodified.

I have so far implicitly assumed that underspecification improves on lexical ambiguity not only in terms of economy of description, but that it is also instrumental in providing an answer to McCloskey's generalisation. To make this point fully explicit, let me summarise how the present approach accounts for the fact that in languages offering resumption, it is all pronouns, and only pronouns that do assume this function. The answer offered by the present approach is two-fold: as to the first clause (all pronouns), it is sufficient to assume that languages vary as to whether they include *pronominal* or only the more specific type *pronoun* in their descriptions of pronominals. The answer to the second part of the generalisation is slightly more complex: as suggested by the present approach, disambiguation according to resumptive vs. pronominal use requires statement of a semantic relation for non-resumptive uses.

[1] Although Hausa verbs may take both direct and indirect objects, the latter are complements of the applicative marker *wà* (Abdoulaye, 1992).

Since type hierarchies are static, a single, concrete relation needs to be provided. It so happens that pronouns are the prototypical elements that can provide a constant relation, yet still fill every cell of the paradigm, making them compatible at the INDEX-level with every potential antecedent. Thus, instead of postulating different principles to account for resumption, this approach merely postulates a more abstract representation of what constitutes a pronominal.



UDCs Pronoun

Figure 6: Sample analyses and generator results: Parse tree, MRS elementary dependencies and generator result

The take on the semantics of resumptive vs. ordinary pronoun use in terms of latent syntactic and semantic constraints differs from the one adopted by Asudeh (2011, 2012), who assumes that resumptive pronouns create a resource surplus (pronominal semantics) that is later consumed by a manager resource (contributed at the top of the dependency). While Asudeh's approach is certainly workable within the specific confines of LFG and Linear Logic (see the detailed discussion below), the present approach offers the further advantage of providing identical semantic representations for gaps and resumptives. Given the overlap of the two extraction strategies, uniformity of representation is a highly desirable property, since paraphrasis in generation falls out directly.

Figure 6 provides sample analyses of Hausa pronominals in both resumptive and ordinary pronoun function, as implemented in the computational grammar HaG (http://hag.delph-in.net/logon; Crysmann, 2012a): at the top, we see the simplified parse trees for *Halima ce muka kawo mata kifi.* 'It's Halima we brought fish for.' and *Mun kawo mata kifi.* 'We brought her fish.', respectively. The resumptive indirect ob-

ject pronoun[2] *mata* on the left is characterised by a SLASH value that is amalgamated onto the verb, and the TAM/agreement auxiliary *mukà*. The ordinary indirect object pronoun *mata* on the right, by contrast, has an empty SLASH value.

Just below each parse tree you find the semantics (MRS in elementary dependency format): with resumptive function, the value of ARG2 (x5) of the applicative relation is reentrant with the proper name *Halima*, and there is no pronominal relation other than that for the first plural subject. This is indeed the exact same semantic representation as one would obtain with a gap in lieu of the resumptive: regenerating the surface strings from these semantics yields a gap-type realisation (*Halima ce muka kawo wa kifi.*) alongside the resumptive one. With ordinary pronoun function, as shown on the right, the value of ARG2 of the applicative (x10) is reentrant with a third singular feminine pronoun. Regenerating from these semantics only yields a single surface string, containing an overt pronominal.

2.2.1 Adjuncts

The current take on resumption follows Borsley in identifying argument structure as the locus where the decision between resumptive and non-resumptive function is placed. This move raises the obvious question how adjuncts will be integrated under this perspective. There are essentially two sub-questions to be addressed here: first, resumptives contained within adjuncts, and second, adjunct resumptives.

Empirically, resumptives contained within adjuncts are well-attested: they are found, inter alia, with certain "true" prepositions, such as *dàgà* 'from' and *dà* 'with'.

(19) a. sàndā sukà dɔ̃kē shì dà ita
stick 3P.CPL beat 3S.DO with 3S.F
'It was a stick they beat him with.' (Jaggar, 2001)

b. * sàndā sukà dɔ̃kē shì dà ∅
stick 3P.CPL beat 3S.DO with
'It was a stick they beat him with.'

In addition to "true" prepositions, genitive prepositions (also known as prepositional nouns), may take overt resumptive complements. In contrast to the former, yet parallel to verbs and verbal nouns, we also find zero realisation here.[3]

(20) a. àdakā̀ mukàn sâ kuɗi-n-mù ciki -n -tà
box 1PL.HAB put money-L-1P inside L 3S.F
'It's inside a box we usually put our money.'

[2] The grammar treats indirect objects as inflected forms of the applicative marker *wà*.

[3] While it is clear that prepositional nouns admit zero pronominal direct objects with non-human reference (cf. Tuller, 1986, p. 357), as well as long extraction out of relatives (cf. Tuller, 1986, p. 361), it remains open whether prepositional nouns support filler-gap dependencies as well, e.g. for extraction of non-human referents. Examples where the locatum is animate are rare in general and the examples provided in Tuller (1986) are, unfortunately, inconclusive with respect to gap status.

b. àdakǎ̀ mukàn sâ kuɗi-n-mù ciki ∅
box 1PL.HAB put money-L-1P inside
'It's inside a box we usually put our money.' (Jaggar, 2001)

We can conclude that adjunct status per se does not constitute an island in Hausa, at least not for resumptive dependencies (see footnote 3). As for launching the non-local dependency, note that the resumptives in question are local complements of the prepositional head, i.e. adjunct status is involved in SLASH passing, but not in SLASH introduction.

As shown by the data above, the necessity of permitting overt or covert resumptives within adjuncts is evident in Hausa. In order to integrate the possibility for an adjunct daughter to contribute to the mother's SLASH value, all it takes is to complement head-driven SLASH percolation with a specific constraint on head-adjunct structures that determines the mother's SLASH value on the basis of both the head and the adjunct daughter. There are several ways to accomplish that: in versions of HPSG that are based on the Generalised Head Feature Principle of Ginzburg and Sag (2001), head adjunct phrases will merely constitute a specific override of general default SYNSEM sharing. Note further that exceptional SLASH passing out of adjuncts has already been attested for English, e.g. in the context of parasitic gaps (Pollard and Sag, 1994). Similarly, the English Resource Grammar (ERG; Copestake and Flickinger, 2000) permits SLASH inheritance from adjuncts in order to account for preposition stranding.

The second central question regarding adjuncts is whether or not they give rise to resumptives themselves. As far as Hausa is concerned, this does not seem to be the case (Newman, 2000; Jaggar, 2001): either we find stranding of the preposition (with a gap or resumptive), or else the entire adjunct phrase is pied-piped, as illustrated in (21).

(21) a. à Kanȍ akà hàifē nì
at Kano 4.CPL give.birth 1S.DO
'It was in Kano I was born' (Jaggar, 2001)

b. dà sàndā sukà dȍ̀kē shì
with stick 3P.CPL beat 3S.DO
'It was a stick they beat him with.' (Jaggar, 2001)

c. ciki -n àdakǎ̀ mukàn sâ kuɗi-n-mù
inside L box 1PL.HAB put money-L-1P
'It's inside a box we usually put our money.' (Jaggar, 2001)

Incidentally, this observation regarding adjuncts is replicated in an even stronger form in Coptic Egyptian: while arguments in this language only ever relativise by means of resumption, adjuncts constitute the only instance where we find a gap-type dependency in Coptic (Crysmann and Reintges, 2014). This asymmetry in the grammar of resumption is not entirely unexpected: as argued on the basis of the semantics of intersective modifier attachment (Levine, 2003), adjunct extraction is best con-

ceived as syntactic, whereas a lexical account appears preferable for argument extraction (Pollard and Sag, 1994, ch. 9).

3 Discussion

3.1 Comparison to Asudeh (2011, 2012)

Within LFG, Asudeh (2011, 2012) has developed a theory of resumption that departs from the assumption that resumptive pronouns are always the standard pronouns of the language. In order to neutralise the semantic surplus contributed by the pronoun in the case of resumptive use (see our discussion in section 2.1.1 above), he invokes a so-called "manager resource" to consume the extra pronominal semantics. Asudeh's theory further distinguishes syntactically inactive resumptives, which are indistinguishable from gaps in terms of island-sensitivity and across-the-board extraction (inter alia), from syntactically active ones, which contrast with gaps in being island-insensitive. While the distribution and interpretation of syntactically active resumptives is captured entirely in terms of obligatory anaphoric binding between the top and the bottom of the dependency, i.e. in semantic structure, syntactically inactive resumptives are linked to the filler or relativiser by means of functional equality, just like filler-gap dependencies. However, in order to circumvent a violation of Functional Uniqueness, the functional equation relating the top of the dependency to the base needs to invoke feature restriction (Kaplan and Wedekind, 1993) to discard identity of PRED values in case of resumption, yet enforce identity otherwise.

Trying to apply Asudeh's theory to the data at hand faces the obvious question as to whether we are dealing with resumptives of the syntactically active or rather the inactive kind. As we have seen in the synopsis of section 1 on page 5 above, island sensitivity of Hausa resumptives is differentiated according to the type of unbounded dependency construction: while relativisation footed by a resumptive is island insensitive, giving rise to "long" relativisation, wh extraction clearly is island sensitive, treating resumptives and gaps on a par. One way of making sense of this situation in Asudeh's terms, is to assume that Hausa has both syntactically active and inactive resumptives, constructionally distinguishing between the two. As a consequence, wh and focus fronted fillers will employ functional equality (island sensitive), whereas relativisation will employ either functional equality or anaphoric binding, depending on the construction. Since relative unbounded dependencies license gaps in Hausa, functional equality must be included as one of the options. Similarly, as witnessed by (16), ATB extraction treats resumptives and gaps on a par, so we are likely to include functional equality under restriction of PRED as an option. Finally, for island-insensitive long relativisation, we will need to include anaphoric binding, additionally being restricted to long extraction, in order to avoid spurious ambiguity. As a result, the phrase structure rule introducing relative complementisers will be three-ways disjunctive.

In the context of the present paper, the most important question is as to how Asudeh's approach compares to the one proposed here on the technical as well as the

conceptual level, and whether it may benefit current approaches in HPSG?

On a conceptual level, it seems that underspecification with latent semantics and equally latent SLASH specification displays some similarity to what is achieved by feature restriction. The main difference is, however, that our present analysis never retracts any information, but rather expands an underspecified type to either pronominal semantics or UDC syntax, depending on whether the pronominal happens to display ordinary pronoun or resumptive function. Furthermore, underspecification not only attacks the syntactic side of the problem, but also inserts pronominal semantics exactly as required, by means of type inference. As a result, a resource surplus never arises, obviating the need to stipulate special manager resources to handle it. Therefore, the present approach is compatible with a wide range of approaches to semantic representation, including standard MRS or LRS (Richter and Sailer, 2003), rather than being dependent on a particular logic.

Furthermore, the current approach captures filler–gap dependencies as well as syntactically active and inactive resumptive dependencies by one and the same mechanism (SLASH percolation), rather than two different ones, as is the case for Asudeh (2011, 2012). Here, differences pertaining to island sensitivity are captured exclusively by means of the constraints imposed along the extraction path, targetting the type of local values admissible on SLASH. As a direct benefit, both syntactically active and inactive resumptives are predicted to be compatible with gaps in ATB extraction, irrespective of their status regarding island-sensitivity: this situation is found e.g. with Hebrew resumptives, a situation which is not directly captured by Asudeh's account, where only syntactically inactive resumptives are assimilated to gaps.

On a technical level, differences become even more pronounced: first, HPSG does not recognise the existence of a separate level of f-structure containing semantic predicates yet being distinct from semantics proper. Second, as far as I am aware, restriction is not a commonly assumed operation on feature structures in HPSG theory.[4] Furthermore, the idea of setting aside parts of a feature structure not only runs counter to the spirit of HPSG, which rather exploits the feature geometry to abstract over sets of features, but it also conflicts severely with the appropriateness function of typed feature structures. To conclude, despite some similarities in basic intuitions, a literal adoption of Asudeh's LFG approach appears to be at odds, both technically and conceptually, with basic assumptions of HPSG.

3.2 The place of island constraints

A property that the current proposal shares with e.g. Asudeh (2011, 2012) but that crucially distinguishes it from Borsley (2010) and Alotaibi and Borsley (2013) pertains to the possibility of handling island-sensitivity grammar-internally.

For Welsh, where there is no difference between gaps and resumptives in terms of island sensitivity, Borsley (2010) rightfully concludes that there is no need to draw

[4] Restriction is actually used in processing with HPSG, in order to increase packing rates for local ambiguity factoring (Oepen and Carroll, 2000). However, during unpacking, features that have been restricted out are reconstructed deterministically and indiscriminately.

a distinction according to extraction strategy. However, Alotaibi and Borsley (2013) settle on the same conclusion for Modern Standard Arabic, despite the fact that in this language resumption facilitates wh extraction from strong islands, whereas gap-type extraction is illicit in these contexts. To work around this problem, they refer, inter alia, to Hofmeister and Sag (2010), claiming that the acceptability contrast might just as well be attributed to performance effects. Interestingly enough, though, Hofmeister and Sag (2010) do not discuss resumption at all. Moreover, Alotaibi and Borsley (2013) do not offer any processing constraint that may explain the contrast. This becomes even more difficult if the grammatical treatment does not draw any distinction in terms of the non-local dependency, which, in the case of Alotaibi and Borsley (2013) is uniform SLASH passing.

A study, however, that may shed some light on the question is Alexopoulo and Keller (2007): investigating (intrusive) resumptives in English, German, and Greek, they observe that use of resumptive elements improve acceptability with weak islands and deep nesting without island constraint violations, yet do not improve acceptability for strong islands, most notably extraction out of relative clauses. They explicitly correlate this difference with the competence/performance distinction, concluding that strong island effects should be handled by the grammar.

In Hausa, however, resumption improves acceptability even for strong islands, suggesting that we are dealing with truly grammatical, not intrusive, resumption (in the sense of Sells, 1984).[5] Yet, as shown in the data discussion above, Hausa still observes a marked contrast depending on the top of the dependency: while relativisation out of relatives or wh-islands is possible, wh-extraction out of these construction remains ungrammatical, regardless of the use of a resumptive. I therefore conclude that this selective insensitivity to strong islands calls for an treatment in grammatical terms, as offered, e.g. by the weight-based perspective I have proposed in Crysmann (2012b) and Crysmann (2013).

4 Conclusion

In this paper I have proposed a synthesis of the approaches by Borsley and Crysmann regarding the treatment of resumptive and gap dependencies in HPSG and applied it to the case of Hausa. I have argued more specifically that a proper account of resumptive vs. ordinary pronoun semantics can be provided in HPSG on the basis of underspecification in a type hierarchy of *synsem* values. In order to address McCloskey's generalisation, the present approach embraces Borsley's idea that the decision with respect to resumptive function should be associated with the governing head and its argument structure. Concerning the representation of pronominals, however, the present take favours an approach in terms of underspecification, in order to facilitate both compositional semantics and the treatment of SLASH propagation. In future work, I shall establish how the current proposal will scale up to the treatment

[5] This is further corroborated by the fact that some lexical heads, e.g. true prepositioins require the presence of a resumptive pronouns independently of the complexity of the extraction construction.

of Modern Standard Arabic or Irish.

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