Resumption and case: A new take on Modern Standard Arabic

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Abstract

Over the past few years, there has been renewed interest in the treatment of resumption in HPSG: despite areas of convergence, e.g. the recognition of resumptive dependencies as SLASH dependencies, as motivated by Across-the-Board (ATB) extraction, there is no unified theory to date, with differences pertaining, e.g., to the exact formulation of SLASH amalgamation (Ginzburg and Sag, 2000), or the place of island constraints in grammar. While Borsley (2010) and Alotaibi and Borsley (2013) relegate the difference in locality of gap and resumptive dependencies to the performance system, Crysmann (2012, 2016) captures insensitivity to strong islands as part of the grammar. Harmonising existing proposals becomes even more acute, if we consider the cross-linguistic similarity of the phenomenon, in particular, if we compare languages like Hausa and Arabic, which both feature island insensitivity to some degree, as well as bound pronominal resumptive objects and zero pronominal resumptive subjects, to name just a few of the parallels.

In this paper, I shall reexamine resumption (and extraction) in Modern Standard Arabic (henceforth: MSA) and propose a reanalysis that improves on Alotaibi and Borsley (2013) in several areas: in particular, I shall argue that controlling the distribution of gaps and resumptives by means of case is not only empirically under-motivated but also leads to counter-intuitive constraint specifications in the majority of cases. I shall show that the case-based account of Alotaibi and Borsley (2013) can be straightforwardly supplanted with the weight-based account I proposed in Crysmann (2016): in doing this, one does not only get a better alignment of case assignment constraints with overtly observable manifestations of case, but such an account is also general enough to scale from case languages, such as MSA, to languages without case, such as Hausa, or many Arabic vernaculars. Finally, I shall address case in ATB extraction and propose a refinement of the Coordination Constraint of Pollard and Sag (1994) that accounts for exactly the kind of mismatch observed in mixed gap/resumptive ATB extraction.

1 Gaps and resumptives in MSA

Unbounded dependency constructions in MSA provide evidence for both gap and resumptive strategies in the grammar of extraction: as shown in Alotaibi and Borsley (2013), some constructions only permit resumption, others only permit gap-type extraction, whereas extraction of direct objects displays both strategies.[1]

As shown in (1), arguments of prepositions, as well as possessor arguments of nouns may only extract with a resumptive element in situ (a bound pronominal affix).[2] The obligatoriness of resumption with obliques appears to be a recurrent pattern cross-linguistically, characterising e.g. Hausa (Tuller, 1986), Hebrew (Sells, 1984), or Welsh (Borsley, 2010).

[1] In this section, I follow essentially the empirical description of the basic patterns in Alotaibi and Borsley (2013).

[2] For reasons of space, I shall gloss over the possibility of pied piping which is immaterial for the points made here.

(1) a. ʔayy -u/*-i ʤaamiʕat-in ðahaba Aħmad-u ʔilai -ha / *∅ ?
which -NOM/-GEN university-GEN went.3SM Ahmad-NOM to -it
'Which university did Ahmad go to?' (A&B 2013, p. 7)

b. ʔayy -u/*-i muʔallif-in garaʔa Aħmad-u kitaab-a -hu / *∅ ?
which -NOM/-GEN author-GEN read.3SM Ahmad-NOM book-ACC -his
'Which author's book has Ahmad read?' (A&B 2013, p. 7)

What is interesting about MSA, is the case of the filler which does not match the case assignment in situ, which would be genitive, rather than nominative case.

By contrast, non-nominal complements, e.g. PP-complements of verbs or adjectives may only extract by means of a gap strategy.

(2) ʔila ʔayy-i ʤaamiʕat-in ðahaba Aliy-un ∅ ?
to which-GEN university-GEN went.3SM Ali-NOM
'To which university did Ali go?' (A&B 2013, p. 11)

(3) min maðaa kaana Aħmad-u khaaʔif-an ∅ ?
from what was Ahmad-NOM afraid-ACC
'Of what was Ahmad afraid?' (A&B 2013, p. 11)

Direct objects, however, witness overlap between the two strategies: while it is possible to extract by means of a gap strategy in certain constructions, cf. (4), others feature the presence of a bound pronominal affix on the governing verb (5).

(4) ʔayy-a T-tullaab-i qaabala l-qaaʔid-u ∅ ?
which-ACC the-students-GEN met.3SM the-leader-NOM
'Which of the students has the leader met?' (A&B 2013, p. 8)

(5) ʔayy-u T-tullaab-i qaabala-**hum** l-qaaʔid-u ?
which-NOM the-students-GEN met.3SM-them the-leader-NOM
'Which of the students has the leader met?' (A&B 2013, p. 8)

Choice between the two strategies depends on several factors: first, while both strategies are available with wh-extraction and relatives with a definite antecedent, only resumption is an option with indefinite antecedents (6). Furthermore, extraction out of strong islands, e.g. relative clauses make use of a resumptive obligatory (7).

(6) qaabaltu rajul-an [ʔaʕrifu -hu / *∅] ?
met.1SM man-ACC knew.1SM -him
'I met a man that I knew' (A&B 2013, p. 9)

(7) ʔayy -u/*-a bint-in raʔaita l-ʔasad-a llaðii ʔakala -ha / * ∅
which -NOM/-ACC girl-GEN saw.2SM the-lion-ACC that ate.3SM -her
'Which girl did you see the lion that ate?' (A&B 2013, p. 12)

Case marking of fillers correlates with the choice of extraction strategy: while gaps display a matching effect, giving accusative case on the filler, the fronted constituent bears nominative case in the event of a resumptive. Note that nominative case

marking of fronted possessors as in (1b) or complements of prepositions (1a), which appear in the genitive when in situ, is congruent with this observation.

As for subject extraction, Alotaibi and Borsley (2013) observe that the subject-agreement pattern (full agreement in person, number, and gender) in relativisation and wh-fronting (8) parallels that of topicalised (9) and pro-dropped (10) subjects, in contradistinction to post-verbal subjects (11) in situ (partial agreement in person and gender).

(8) ʔayy-u Tullaab-in ʕaraf-uu / *ʕarafa l-ʔijaabat-a?
which-NOM students-GEN knew.3PM knew.3SM the-answer-ACC
'Which students knew the answer?' (A&B 2013, p. 10)

(9) T-tullaab-u qaabaluu / *qaabala Aħmad-a
the-students-NOM met.3PM met.3SM Ahmad-ACC
'The students met Ahmad' (A&B 2013, p. 9)

(10) a. laqad qaabala Aħmad-a
indeed met.3SM Ahmad-ACC
'He met Ahmad.' (A&B 2013, p. 10)

b. laqad qaabaluu Aħmad-a
indeed met.3PM Ahmad-ACC
'They met Ahmad.' (A&B 2013, p. 10)

(11) qaabala / *qaabaluu T-tullaab-u Aħmad-a
met.3SM met.3PM the-students-NOM Ahmad-ACC
'The students met Ahmad' (A&B 2013, p. 9)

Alotaibi and Borsley (2013) therefore correlate fronting with the null subject property and conclude that subject extraction involves a zero resumptive, rather than a gap.

2 Alotaibi and Borsley (2013)

In order to capture the distribution of gaps vs. resumptives, Alotaibi and Borsley (2013) suggest that gap dependencies involve full reentrancy between an argument's LOC value with a member of SLASH, whereas resumptives, which are treated as ordinary pronominals in the spirit of McCloskey (2002) and Borsley (2010), give rise to an optional NP member on SLASH where reentrancy with the pronominal argument is limited to INDEX.

Now given that the slashed NP specification exhibits only very limited reentrancy with properties of the resumptive element, exempting most of CONT (leaving alone INDEX) and all of CAT, the exceptional assignment of nominal case to the filler of resumptive unbounded dependencies is finally accounted for by means of restricting this specific member of SLASH to nominative case. To this end, they propose an implicational constraint on words where a pronominal argument has its INDEX shared with an element in SLASH, see (12).

(12)
$$\begin{bmatrix} \textit{word} \\ \textsc{slash} & \left\{ \boxed{1} \begin{bmatrix} \textsc{index} & \boxed{2} \end{bmatrix} \right\} \\ \textsc{arg-st} & \left\langle \ldots \begin{bmatrix} \textit{pro} \\ \textsc{index} & \boxed{2} \end{bmatrix} \ldots \right\rangle \end{bmatrix}$$
$$\overrightarrow{\begin{bmatrix} \textsc{slash} & \left\{ \boxed{1} \begin{bmatrix} \textsc{case} & \textit{nom} \end{bmatrix} \right\} \end{bmatrix}}$$

Assignment is thus uniformly fixed at the bottom of the dependency, affecting both resumptive and gap dependencies. Given that case properties are imposed on SLASH elements, either by reentrancy (gap) or stipulation (resumptives), they inevitably percolate up, ensuring nominative fillers for resumptives and matching fillers for gaps.

Alotaibi and Borsley (2013) further propose that case can be used to control the distribution of gaps and resumptives in a more fine-grained way. While definite relatives marked by the complementiser *llaði* license both gaps and resumptives for direct objects, indefinite relatives, which are headed by a zero complementiser according to Alqurashi and Borsley (2012), only permit a resumptive. Alotaibi and Borsley (2013) suggest that this difference can be captured by the following lexical entries for *llaði* (13) and the zero relative complementiser (14):

(13)
$$\begin{bmatrix} \textsc{ph} & \left\langle \text{llaði} \right\rangle \\ \textsc{hd} & \begin{bmatrix} \textit{comp} \\ \textsc{mod} & \text{NP} \begin{bmatrix} \textsc{def} & + \\ \textsc{ind} & \boxed{i} \end{bmatrix} \end{bmatrix} \\ \textsc{comps} & \left\langle \text{S} \left[\textsc{slash} \left\{ \text{NP} \begin{bmatrix} \textsc{ind} & \boxed{i} \end{bmatrix} \right\} \right] \right\rangle \end{bmatrix}$$

(14)
$$\begin{bmatrix} \textsc{ph} & \left\langle \right\rangle \\ \textsc{hd} & \begin{bmatrix} \textit{comp} \\ \textsc{mod} & \text{NP} \begin{bmatrix} \textsc{def} & - \\ \textsc{ind} & \boxed{i} \end{bmatrix} \end{bmatrix} \\ \textsc{comps} & \left\langle \text{S} \left[\textsc{slash} \left\{ \text{NP} \begin{bmatrix} \textsc{case} & \textit{nom} \\ \textsc{ind} & \boxed{i} \end{bmatrix} \right\} \right] \right\rangle \end{bmatrix}$$

The crucial difference between the two entries is that (13) underspecified the case value for the NP on SLASH, whereas (14) restricts this value to nominative case.

3 Problems with case

3.1 ATB extraction

The idea to exploit case properties in order to regulate the distribution of resumptives and gaps runs into quite some serious problems once we consider ATB extraction.

In MSA, like in many other languages that offer both gap and resumptive strategies, mixing of gap and resumptives is possible, as shown, e.g. in (15): while the ATB constraint can be shown to be operative in the language, it apparently treats gap and resumptive dependencies alike.

(15) a. * man [[tuħibu ∅] wa [tušaʤiʕu Aħmad-a fii nafs-i l-waqt-iʕ]]
who like.2SM and support.2SM Ahmad-ACC in same-GEN the-time-GEN
'Who do you like and support Ahmad at the same time?' (A&B 2013, p. 13)

b. man [[tuħibu ∅] wa [tušaʤiʕu ∅ fii nafs-i l-waqt-iʕ]]
who like.2SM and support.2SM in same-GEN the-time-GEN
'Who do you like and support at the same time?' (A&B 2013, p. 13)

c. man [[tuħibu ∅] wa [tušaʤiʕu **-hu** fii nafs-i l-waqt-iʕ]]
who like.2SM and support.2SM -him in same-GEN the-time-GEN
'Who do you like and support at the same time?' (A&B 2013, p. 14)'

It is precisely for this reason that almost all approaches to resumption in HPSG treat both dependencies via SLASH.

As discussed by Alotaibi and Borsley (2013), mixing of resumptives and gaps leads to a conflict of case specifications on SLASH: if nominative case is assigned at the bottom of a resumptive dependency, yet standard accusative is assigned to object gaps, unification of SLASH values must fail. However, mixing is not only possible with case-ambiguous fillers, as in (15), but also with unambiguously case-marked fillers. Speakers find resolution to the gap's accusative case requirement perfectly acceptable, whereas judgements degrade for nominative: "[t]hey find examples like [(16b)] with nominative case less acceptable, but do not generally reject them" (Alotaibi and Borsley, 2013, p. 21).

(16) a. ʔayy -a Tullaab-in [[qaabalta ∅] wa [taħaddaϴta ʔilai**-hum**]]?
which -ACC students-GEN met.2SM and talked.2SM to-them
'Which students have you met and talked to?' (A&B 2013, p. 21)

b. ? ʔayy -u Tullaab-in [[qaabalta ∅] wa [taħaddaϴta ʔilai**-hum**]]?
which -NOM students-GEN met.2SM and talked.2SM to-them
'Which students have you met and talked to?' (A&B 2013, p. 21)

As admitted by the authors, both the perfectly well-formed accusative variant and the marginal nominative one are erroneously ruled out as ungrammatical by their account. This analysis of MSA resumption therefore contradicts the standard account of the ATB effect (Pollard and Sag, 1994), which derives the constraint quite elegantly by simple unification of the SLASH sets of the conjunct daughters.

3.2 *ʔanna* clauses

It is of note that MSA provides no evidence that case transmission is required in resumptive dependencies, owing to the absence of a matching effect: with wh-extraction, the stipulated nominative case assignment at the bottom hardly ever corresponds to what case would normally be assigned here, which is either accusative (for direct objects) or genitive (prepositions and possessed nouns).

Relative complementisers equally fail to provide any evidence for case matching. With indefinite relatives, where use of a resumptive is obligatory, no matching can ever be observed, due to the trivial fact that the complementiser is zero. Furthermore, the resumptives themselves are bound pronominals unmarked for (nominative) case or pro-dropped.

The definite relative complementiser *llaði*, by contrast, does inflect for case, but the case marking we observe is due to agreement with the antecedent noun (Alqurashi and Borsley, 2012, p. 29). As a result, we do not find any evidence for a matching effect along the SLASH dependency, whether for gaps or resumptives.

An admittedly paradoxical instance of case assignment (Borsley p.c.) is found with *ʔanna* clauses: in these clauses the complementiser assigns accusative case to its sister NP which stands in a non-local dependency with an NP argument contained within the finite clause it is subcategorised for. In (17), the complementiser takes as its accusative complement the topicalised subject of its clausal complement. Recall that full subject-verb agreement is only found with null subjects and topicalisation. Similarly, in (18) we find an accusative topicalised direct object. Interestingly enough, at the bottom of the dependency, we find a bound resumptive: use of a gap strategy, by contrast, is illicit.

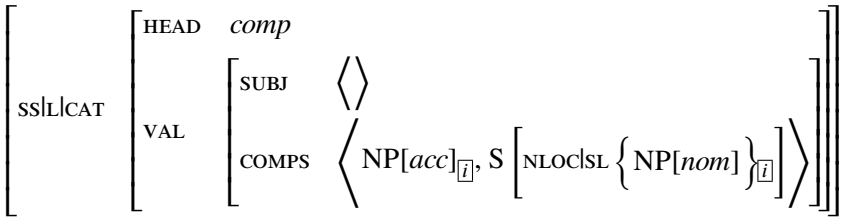
(17) ħasiba Aħmad-u [ʔanna l-ʔawlaad-a ðahabuu].
thought.3.S.M Ahmad-NOM that the-boys-ACC left.3.P.M
'Ahmad thought the boys had left' (A & B 2013, p. 19)

(18) a. ʕalimtu [ʔanna l-qiSat-a garaʔa**-ha** Ahmad-u]
knew.1S.M that the-story-ACC read.3S.M-it Ahmad-NOM
'I knew that (as for) the story, Ahmad read it.' (A & B 2013, p. 23)

b. * ʕalimtu [ʔanna l-qiSat-a garaʔa Ahmad-u ∅]
knew.1S.M that the-story-ACC read.3S.M Ahmad-NOM
(A & B 2013, p. 23)

It should be clear that using case on SLASH values in order to control the distribution of resumptives vs. gaps in MSA is not only under-motivated, but it also leads to counter-intuitive analyses as in the present case (see (19)): with *ʔanna* clauses, the local case the complementiser assigns to the topic never corresponds to the stipulated case assignment on the corresponding SLASH value, which in turn may not even correspond to the case that would normally be assigned at the bottom of the dependency, as for direct objects.

(19) Lexical entry for *ʔanna* (Alotaibi and Borsley, 2013, p. 24)



3.3 Long extraction

The third problem associated with using case properties to regulate the distribution of resumptives and gaps comes from long extraction out of relative clauses. As illustrated in (20), long extraction is possible e.g. out of relatives, yet only with a resumptive at the bottom of the long non-local dependency. I.e. while the dependency that the complementiser binds may involve either a gap or a resumptive, the dependency that passes through must be resumptive.

(20) ʔayy-u bint-in raʔaita l-ʔasad-a llaðii ʔakala-ha
which-NOM girl-GEN saw.2SM the-lion-ACC that ate.3SM-her
'Which girl did you see the lion that ate?' (A&B 2013, p. 12)

In the logic of Alotaibi and Borsley's approach, this fact would require *llaði* to constrain case on a member of SLASH that it neither binds, nor locally constructs with, i.e. an instance of long distance case assignment. This certainly constitutes a very marked analytical option. By contrast, the fact that relative clauses constitute strong islands is a common observation, and it is equally well attested that resumptive languages may treat gap and resumptive dependencies differently with respect to islandhood, barring long extraction with the former, while permitting it with the latter (cf. Tuller, 1986; Crysmann, 2012, for Hausa).

Synopsis

Taken together, the case-based approach by Alotaibi and Borsley (2013) not only appears to be empirically under-motivated in MSA, but has clearly paradoxical consequences, i.e. case assignment to SLASH in *ʔanna* clauses that correspond neither to what happens at the top or at the bottom. What is more, the kind of inside-out case assignment to an unrelated dependent, as necessitated by long extraction, appears not only counter-intuitive, but also fails to capture the fact that gaps and resumptives observe different locality conditions, an observation that is obscured by the case-based encoding.

On a more general note, it is far from clear how this particular approach to the distribution of gaps and resumptives will scale up to languages without case, which include many Arabic vernaculars.

Taking a closer look at where exactly case matters in the context of MSA nonlocal dependencies, we find that a matching effect is only ever observed for gap de-

pendencies, whereas with resumptives, case assignment is only ever relevant at the top: i.e. nominative with fillers of resumptive dependencies, accusative for the NP complement of *ʔanna*, and agreement case with the antecedent noun for *llaði*.

Thus, in what follows, I shall assume transmission of case in resumptive dependencies is unnecessary and I shall propose instead to regulate the distribution of gaps vs. resumptives in terms of a theory of strong islands that seems to be independently needed to make sense of long extraction in MSA, but which has the further potential to scale up to case-full and case-less languages alike.

4 A reanalysis

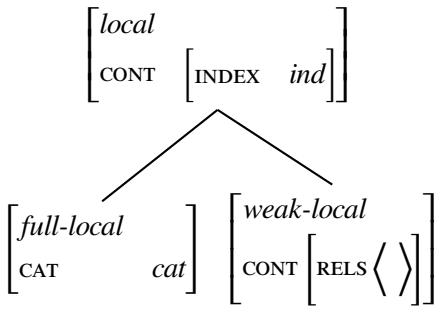
In order to resolve the problems associated with case assignment to SLASH values, I shall propose that gap dependencies are subject to a matching effect, readily modelled by percolation of *local* values, whereas resumptive dependencies in MSA are purely anaphoric dependencies, excluding transmission of categorial features, an option provided for by the underspecified theory of resumption I have proposed in previous work on Hausa (Crysmann, 2012, 2015, 2016). As a consequence, case assignment with resumptive dependencies will only ever be possible at the top, in accordance with the empirical evidence. The distribution of gaps vs. resumptives, however, will be regulated by reference to the amount of information being transmitted on SLASH: full local information for gaps, and purely indexical information for resumptives. Furthermore, we shall see that island constraints can be expressed solely in terms of this informational difference, providing an account that scales across languages with and without case.

4.1 A weight-based theory of extraction and resumption (Crysmann, 2016)

The weight-based theory of resumption and extraction implements a distinction of SLASH elements in terms of the amount of information that is minimally or maximally transmitted. As illustrated by the type hierarchy in (21), *local* values are differentiated according to the amount of information they carry: While *weak-local* contains no CAT, and only INDEX features in CONT, *full-local* has both CAT and CONT features, including semantic relations on RELS. The value of the LOC attribute of *synsem* objects therefore is of the latter type, cf. Figure 1. As a consequence, *weak-local* values essentially live on non-local features, such as SLASH sets.[3] Reentrancy of an element with a LOC feature, as with the standard filler-head schema (28) or for the type *gap-synsem* (Figure 1), automatically coerces the element into the full type.

(21) Types hierarchy of *local* values

[3]See Crysmann (2013) for a similar proposal regarding locality constraints on complement clause vs. relative clause extraposition.



The crucial point of this theory now is that resumptives by themselves may be underspecified as to the local type on their SLASH set: what they minimally require is sharing of INDEX.

4.2 The bottom of the dependency in MSA

Without anything else being said, resumptives should be able to occur wherever a gap can. While this is a valid observation for Hausa, MSA observes a stricter separation, witnessing more disjoint distributions of gaps and resumptives. To this end, I shall propose that in MSA the type *resump* restricts its SLASH set to contain an element of type *weak-local*, as shown in (22). Note that I have made explicit the information inherited from its super-types, namely *slashed* and *pronominal-synsem*.

(22)
$$\begin{bmatrix} \textit{resump} & \\ \textsc{loc} & \begin{bmatrix} \textsc{cont} & \begin{bmatrix} \textsc{ind} & \boxed{i} \\ \textsc{rels} & \langle\,\rangle \end{bmatrix} \end{bmatrix} \\ \textsc{nloc} & \begin{bmatrix} \textsc{inh}|\textsc{sl} & \left\{ \begin{bmatrix} \textit{weak-local} \\ \textsc{cont}|\textsc{ind} \quad \boxed{i} \end{bmatrix} \right\} \end{bmatrix} \end{bmatrix}$$

Regarding the distribution of gaps, which are attested only for NP and PP objects of verbs and adjectives, I shall follow Alotaibi and Borsley (2013) and restrict their distribution based on governing head's category. This can be done either by means of constraining the application of the Complement Extraction Lexical Rule to apply to the COMPS list of lexical heads of these two categories, as given in (23), or else by an implicational constraint, as suggested by Alotaibi and Borsley (2013).

(23)
$$\begin{bmatrix} \textsc{arg-st} & \langle \ldots \boxed{1} \ldots \rangle \\ \textsc{synsem} & \begin{bmatrix} \textsc{loc}|\textsc{cat} & \begin{bmatrix} \textsc{hd} & \textit{verb} \vee \textit{adj} \\ \textsc{val} & \begin{bmatrix} \textsc{comps} & \langle \boxed{1}\, \textit{gap} \rangle \oplus \boxed{c} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

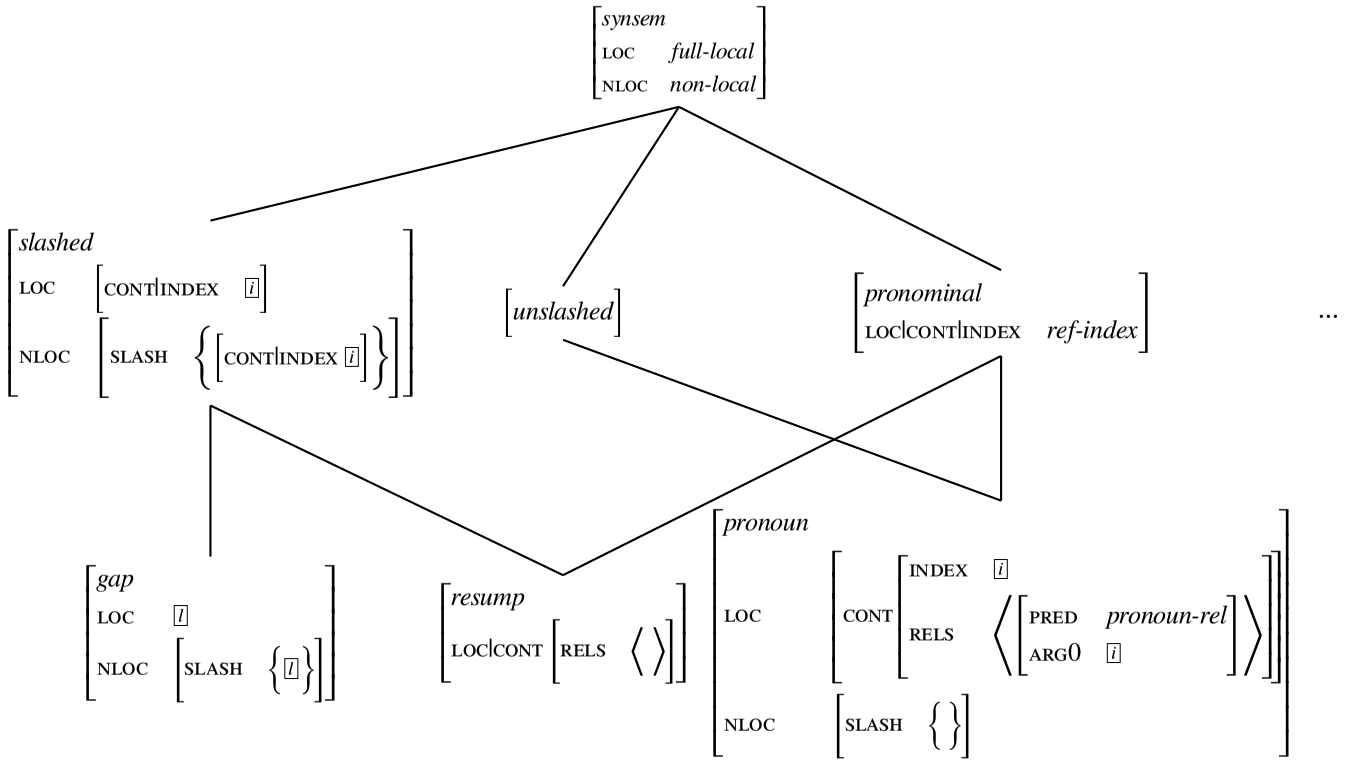


Figure 1: Hierarchy of synsem objects (Crysmann, 2016)

$$\mapsto \left[\text{SYNSEM} \quad \left[\text{LOC}|\text{CAT} \left[\text{VAL} \quad \left[\text{COMPS } \boxed{c} \right] \right] \right] \right]$$

This rule is quite restricted in its scope of application. Therefore, resumptive pronouns fill in (for) the missing gaps, by virtue of the fact that *pronominal-synsem* can either resolve to standard *pronoun-synsem*, or else to the type *resump*, which launches a non-local dependency. Thus, the resumptive dependency just goes piggy-back on the construction that normally licenses pronominal dependents: pro-drop for subjects and pronominal affixation for objects of verbs and prepositions, as well as possessor complements of nouns.

Note, though that this option is only available to individuals, not events, thus excluding the resumptive option e.g. for PP complements.

4.3 The top of the dependency

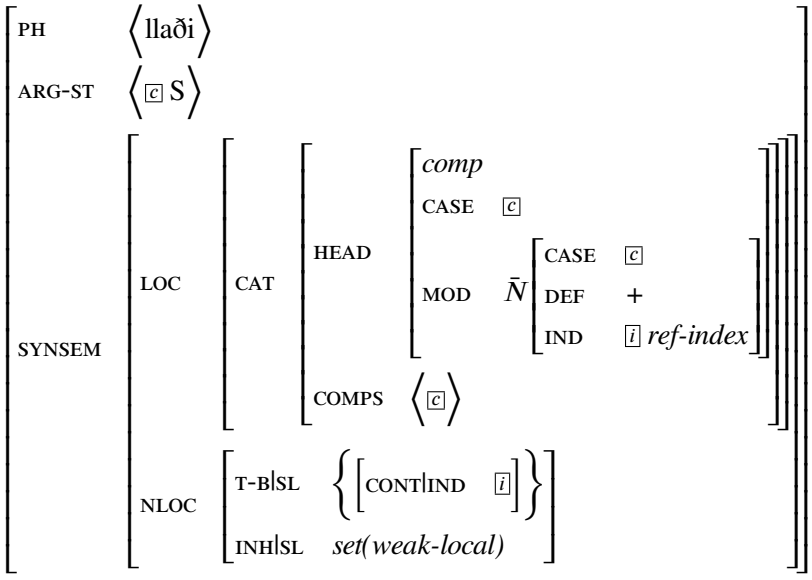
At the top of the dependency, we find at least three different constructions capable of binding a non-local dependency: a relative complementiser, which turns the non-local dependency into a local dependency with the antecedent noun the relative clause modifies, the complementiser *ʔanna*, a kind of weak UDC that turns the non-local dependency into an accusative-marked topic complement, and filler-head structures for wh-fronting.

4.3.1 Relative complementisers

Let us start with the treatment of relative complementisers. Recall that MSA distinguishes between the overt complementiser *llaði* used with definite antecedents and a null complementiser used with indefinites. While *llaði* can bind both gap and resumptive UDCs, the null complementiser obligatorily requires a resumptive at the bottom. What is common to both complementisers is that they do not show any matching effect: while this is obvious for the null complementiser, Alqurashi and Borsley (2012) have shown that agreement in case shown by *llaði* is controlled by the antecedent, not by the non-local dependency.

Compared to the previous analysis by Alotaibi and Borsley (2013), the entry for *llaði* can remain largely unchanged. The only crucial difference is that we need to suppress the restriction to an NP *local* value on the SLASH element, which would be incompatible with *weak-local*. Selectivity for nominal expressions is captured instead by the fact that the shared INDEX is of type *ref-index*, i.e. a referential index, a property which actually derives from the attachment to a nominal antecedent.

(24) Definite relative complementiser *llaði*



As given in (24), the complementiser *llaði* modifies a definite antecedent noun with which it shows case agreement (via MOD). The referential index of the antecedent noun needs to be token-identical with the index of the unbounded dependency that the complementiser binds via its non-empty TO-BIND|SLASH specification.

Given *Slash Amalgamation* (Ginzburg and Sag, 2000), a head's INH|SLASH value is the union of the INH|SLASH values on its argument structure (ARG-ST) minus its TO-BIND|SL. As a consequence, the referential index the relative clause modifies must be a member of the INH|SL value of the complementiser's sole argument, a finite clause. Any further SLASH elements will be passed on.

By way of restricting the complementiser's INH|SL to *weak-local*, we can easily account for the island properties of relative complementisers. Thus, while the *local* type of the dependency that *llaði* binds is itself underspecified, permitting both gaps and resumptives at the bottom, any dependency passing through is restricted to be of the weaker anaphoric type. Note that this analysis is entirely parallel to my previous analysis of long extraction in Hausa.

Turning now to the null relative complementiser, all we need to do is enforce its selectivity for a resumptive dependency.

(25) Null indefinite relative complementiser

$$\left[\begin{array}{ll}
\textsc{ph} & \langle\ \rangle \\
\textsc{arg-st} & \langle \boxed{c}\ \mathrm{S} \rangle \\
\textsc{synsem} & \left[\begin{array}{ll}
\textsc{loc} & \left[\begin{array}{ll}
\textsc{cat} & \left[\begin{array}{ll}
\textsc{head} & \left[\begin{array}{lll} \textit{comp} & & \\ \textsc{mod} & \bar{N} & \left[\begin{array}{ll} \textsc{def} & - \\ \textsc{ind} & \boxed{i}\ \textit{ref-index} \end{array}\right] \end{array}\right] \\
\textsc{comps} & \langle \boxed{c} \rangle
\end{array}\right]
\end{array}\right] \\
\textsc{nloc} & \left[\begin{array}{ll}
\textsc{t-b|sl} & \left\{\left[\begin{array}{ll} \textit{weak-local} & \\ \textsc{cont|ind} & \boxed{i} \end{array}\right]\right\} \\
\textsc{inh|sl} & \textit{set(weak-local)}
\end{array}\right]
\end{array}\right]
\end{array}\right]$$

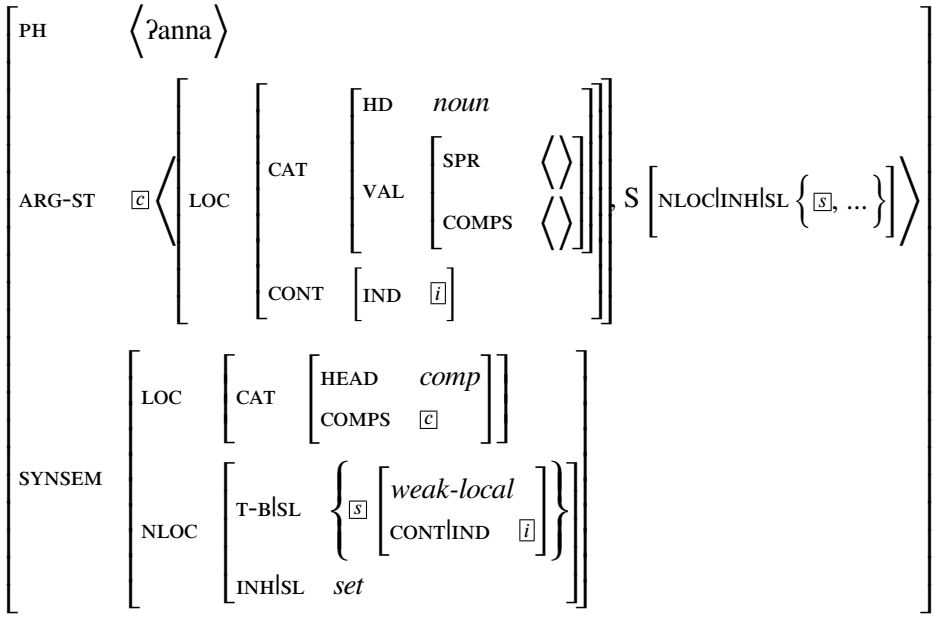
By constraining the element on its T-B|SL to *weak-local*, gaps are effectively banned at the bottom of this dependency, owing to the fact that they require reentrancy with a *full-local*.

Thus, we are able to straightforwardly account for the respective distribution of gaps and resumptives in definite and indefinite relative clauses without making any explicit reference to non-local percolation of case properties. This is in line with the observation that relative clauses in MSA do not provide any evidence for a matching effect. Furthermore, the present treatment of island constraints as a constraint on percolated information is not only entirely parallel to that of Hausa (Crysmann, 2012, 2016), but it also refrains from the kind of long-distance case assignment that would be required by Alotaibi and Borsley (2013).

4.3.2 *ʔanna*-clauses

The analysis of *ʔanna* I am going to propose is actually the mirror image of the analysis of *llaði* given above: while the latter underspecifies the type of unbounded dependency it binds, yet restricts the type of unbounded dependencies that pass through to be of the weaker anaphoric type, *ʔanna* does the exact opposite, requiring that it bind an anaphoric dependency, yet being indifferent about other dependencies passing through.

(26) Complementiser *ʔanna*



As depicted in (26), *ʔanna* takes an NP complement to which it assigns accusative case, as well as a clausal complement. The complementiser further requires that the NP complement's referential index corresponds to a non-local dependency it binds. It further constrains the type of local value to be bound to be of the weaker anaphoric type, possibly motivated by the fact that the NP complement of *ʔanna* is a topic.[4] Since CAT is not an appropriate feature for *weak-local*, categorial information cannot possibly be transmitted along the non-local dependency, including e.g. CASE, so no matching effect should arise. Thus *ʔanna* only ever specifies a case restriction for its complement, without that assignment being transmitted down to the extraction site.

The non-local dependency being bound by the complementiser's NP complement originates on the INH|SL of its clausal complement. Any additional non-local dependencies that may pass through are unconstrained as to their type.

(27) man taʕtaqidu [ʔanna l-ʔawlaad-a qaabaluu ∅]?
who think.2SM that the-boys-ACC met.3PM
'Who do you think that the boys have met?' (A&B 2013, p. 24)

This case is illustrated in (27) where the complementiser's accusative complement binds a null resumptive subject, while the object gap is bound by the matrix wh-filler.

4.3.3 Wh-fillers

Turning finally to fillers, I shall first assume that MSA may introduce phrasal fillers by way of a standard Filler-Head Schema (Pollard and Sag, 1994), as given in (28).

[4]Note that e.g. in Hausa, fronted topics equally choose resumptives, in contrast to focus fronting, which displays a preference for gap strategies (see Newman, 2000; Jaggar, 2001).

(28) Standard Filler-Head Schema

$$\begin{bmatrix} \textit{filler-head-rule} & \\ \textsc{ss} & \left[\textsc{nloc}|\textsc{sl} \quad \textit{set(weak-local)}\right] \\ \textsc{f-dtr} & \left[\textsc{ss}|\textsc{loc} \quad \boxed{1}\right] \\ \textsc{hd-dtr} & \left[\textsc{ss}|\textsc{nloc} \quad \left[\textsc{t-b}|\textsc{sl} \quad \left\{\boxed{1}\right\}\right]\right] \end{bmatrix}$$

Owing to the reentrancy between the filler's LOCAL value with the head-daughter's T-B|SLASH, we expect a restriction of the non-local dependency thus bound to *full-local*, and, as a consequence a matching effect for category and case. While the Filler-Head Schema correctly accounts for the properties of gap-type extraction in MSA, it cannot license any non-local dependencies with a filler at the top and a resumptive at the bottom, owing to incompatibility of *local* subtypes (cf. the definition of *resump* in (22)).

Note, though, that fillers binding a resumptive are special in that they do not enforce a matching effect, but uniformly constrain their fillers to be nominative NPs. I therefore propose that MSA has an additional parochial Filler-Head Schema that correlates binding of a weak anaphoric non-local dependency, devoid of categorial and therefore case properties, with constructional assignment of the unmarked case, i.e. nominative.

(29) Parochial Filler-Head Schema for MSA

$$\begin{bmatrix} \textit{resump-filler-head-rule} & \\ \textsc{ss} & \left[\textsc{nloc}|\textsc{sl} \quad \textit{set(weak-local)}\right] \\ \textsc{f-dtr} & \left[\textsc{ss}|\textsc{l} \left[\textsc{cat} \left[\textsc{hd} \left[\begin{matrix}\textit{noun} \\ \textsc{case} \quad \textit{nom}\end{matrix}\right] \right.\right.\right. \\ & \qquad \left.\left.\left. \textsc{val} \left[\begin{matrix}\textsc{subj} & \langle\,\rangle \\ \textsc{comps} & \langle\,\rangle \\ \textsc{spr} & \langle\,\rangle\end{matrix}\right]\right] \right. \\ & \qquad \left.\textsc{cont} \left[\textsc{ind} \quad \boxed{i}\right]\right] \\ \textsc{hd-dtr} & \left[\textsc{ss}|\textsc{nloc} \left[\textsc{t-b}|\textsc{sl} \left\{\left[\begin{matrix}\textit{weak-local} \\ \textsc{cont}|\textsc{ind} \quad \boxed{i}\end{matrix}\right]\right\}\right]\right] \end{bmatrix}$$

To summarise the difference between the current proposal and the previous one by Alotaibi and Borsley (2013), the main difference lies with the fact that the weight-based approach provides independent control of the distribution of resumptives and

gaps, allowing for the absence of a matching effect in case of the former, yet enforcing a matching effect for the latter. Furthermore, since case does not have to do double duty, we are free to impose constraints pertaining to this property exactly where they can be observed, i.e. at the top of the dependency. The availability of a parochial Filler-Head Schema for which full sharing is not enforced finally may serve to explain differences regarding long extraction: in MSA, availability of a schema like the one in (29) opens up the possibility for wh-fillers to undergo long extraction, provided a resumptives is found at the extraction site, as witnessed, e.g. in (20). In Hausa, by contrast, long extraction is only ever possible for relativisation: wh-fillers can never bind a dependency that originates inside a relative or embedded wh-clause, regardless of the use of a resumptive (Tuller, 1986; Crysmann, 2012). If indeed the grammar of MSA provides an alternate Filler-Head Schema, while Hausa does not, this difference regarding island status follows immediately.

4.4 ATB extraction

Now that we have seen how the basic facts of resumptive and gap-type extraction in MSA can be captured in a weight-based rather than case-based theory, we can move on and address the remaining issue of mismatches in Across-the-board (ATB) extraction.

(30) Coordination Constraint (Pollard and Sag, 1994)
coord-struc →

$$\begin{bmatrix} \text{SS} & \begin{bmatrix} \text{LOC} & [\text{CAT} \ \boxed{c}] \\ \text{NLOC} & \boxed{n} \end{bmatrix} \\ \text{DTRS} & \left\langle \begin{bmatrix} \text{SS} & \begin{bmatrix} \text{LOC} & [\text{CAT} \ \boxed{c}] \\ \text{NLOC} & \boxed{n} \end{bmatrix} \end{bmatrix}, \begin{bmatrix} \text{SS} & \begin{bmatrix} \text{LOC} & [\text{CAT} \ \boxed{c}] \\ \text{NLOC} & \boxed{n} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

Consider again the data in (15) and (16): the core problem for Alotaibi and Borsley (2013) was that object gaps and resumptives specify conflicting case values, which will lead to a unification failure on the SLASH value of the mother of the coordinate structure. Since we have replaced control by case with control by *local* subtype not much has been gained: a gap will introduce a *full-local* member on SLASH, whereas a resumptive will require a *weak-local*. Crysmann (2012, 2015) discussed similar ATB facts in Hausa and exploited the fact that, for individuals, a resumptive can always occur wherever a gap can, which made it possible to have resumptives underspecified as to the *local* subtype on their SLASH. Unfortunately, this possibility is not available for MSA, which necessitates somewhat finer control from the top of the dependency regarding the distribution of resumptives.

Thus, in order to establish a theory of ATB extraction that works across different languages with mixed gap/resumptives strategies independently of other factors, it is necessary to provide a more general solution. To this end, I shall decompose

the Coordination Constraint of Pollard and Sag (1994) into three implicational sub-constraints that will be flexible enough to permit the kind of mismatch observed in ATB extraction involving mixed gap/resumptive strategies.

The first constraint in (31), which I have split into two sub-statements for expository purposes, replicates most of the Coordination Constraint of Pollard and Sag (1994), requiring identity of CAT and NLOC features, except that reentrancy of SLASH values is now weakened to minimally identify indices.

(31) Minimal Coordination Constraint

a. *coord-struc* →

$$\left[\begin{array}{ll} \textsc{ss} & \left[\begin{array}{ll} \textsc{loc} & \left[\textsc{cat}\ \boxed{c}\right] \\ \textsc{nloc} & \left[\begin{array}{ll} \textsc{rel} & \boxed{r} \\ \textsc{que} & \boxed{q} \end{array}\right] \end{array}\right] \\ \textsc{dtrs} & \left\langle \left[\textsc{ss}\ \left[\begin{array}{ll} \textsc{loc} & \left[\textsc{cat}\ \boxed{c}\right] \\ \textsc{nloc} & \left[\begin{array}{ll} \textsc{rel} & \boxed{r} \\ \textsc{que} & \boxed{q} \end{array}\right] \end{array}\right]\right], \left[\textsc{ss}\ \left[\begin{array}{ll} \textsc{loc} & \left[\textsc{cat}\ \boxed{c}\right] \\ \textsc{nloc} & \left[\begin{array}{ll} \textsc{rel} & \boxed{r} \\ \textsc{que} & \boxed{q} \end{array}\right] \end{array}\right]\right] \right\rangle \end{array}\right]$$

b. *coord-struc* →

$$\left[\begin{array}{ll} \textsc{ss|nloc} & \left[\textsc{sl}\ \left\{\left[\textsc{cont|ind}\ \boxed{1}\right], \ldots \left[\textsc{cont|ind}\ \boxed{n}\right]\right\}\right] \\ \textsc{dtrs} & \left\langle \left[\textsc{ss|nloc}\ \left[\textsc{sl}\ \left\{\left[\textsc{cont|ind}\ \boxed{1}\right], \ldots \left[\textsc{cont|ind}\ \boxed{n}\right]\right\}\right]\right], \left[\textsc{ss|nloc}\ \left[\textsc{sl}\ \left\{\left[\textsc{cont|ind}\ \boxed{1}\right], \ldots \left[\textsc{cont|ind}\ \boxed{n}\right]\right\}\right]\right] \right\rangle \end{array}\right]$$

This minimal Coordination Constraint, which already derives the ATB constraint, can then be further refined. I propose a constraint for events on SLASH, that simply re-instantiates indiscriminate full sharing of local values on the mother's SLASH with corresponding members on the two daughters' SLASH sets, thus enforcing a matching effect for extraction of any non-individual denoting dependency, akin to the effect of the original Coordination Constraint of Pollard and Sag (1994). This will make sure that whatever relaxation of identity requirements we may want to permit in the face of NP-gaps and resumptives do not accidentally weaken matching requirements for events.

(32)
$$\left[\begin{array}{ll} \textit{coord-struc} & \\ \textsc{ss|nloc|sl} & \left\{\boxed{e}\left[\textsc{cont|ind}\ \textit{event}\right], \ldots\right\} \end{array}\right]$$

$$\rightarrow \left[\text{DTRS} \left\langle \left[\text{SS|NLOC|SL} \left\{ \boxed{e}, \ldots \right\} \right], \left[\text{SS|NLOC|SL} \left\{ \boxed{e}, \ldots \right\} \right] \right\rangle \right]$$

The last constraint, however, provides for the flexibility to project full sharing from either daughter in a coordinate structure. Or, put differently, it ensures that properties required of the SLASH value of the coordination must hold in full for at least one of the two daughters.

(33) *coord-struc* →

$$\left[\begin{array}{l} \text{SS|NLOC|SL} \quad \boxed{s} \\ \text{DTRS} \quad \left\langle \left[\text{SS|NLOC|SL} \quad \boxed{s} \right] \right\rangle \bigcirc \textit{list} \end{array} \right]$$

The combination of enforcing minimal INDEX sharing for all members of SLASH from all daughters with selective projection SLASH from one daughter will permit the two situations we observed in (16): given that none of the constraints we gave to replace the monolithic Coordination Constraint capitalises on the distinction between *weak-local* and *full-local*, it is clear that both *full-local* and *weak-local* constraints imposed on the mother will be fulfilled, as long as one of the daughters faithfully exhibits full sharing of SLASH with the mother. In case of an accusative filler, only the standard Filler-Head Schema can apply, enforcing a *full-local* percolating down. As a consequence of (33), one of the daughters in the coordinate structure will have a SLASH specification with a corresponding *full-local*, requiring a gap. In case of a nominative filler, only the parochial schema will apply, and a *weak-local* will be imposed as a member of the SLASH on the coordinate structure. Again, by virtue of (33), one of the daughters will have to fulfil this requirement, enforcing presence of a resumptive. The ATB constraint itself, including the sharing of indices for extracted items across conjuncts are independently accounted for by the minimal identity requirements stated in (31).

5 Conclusion

In this paper, I have proposed an analysis of resumption and ATB extraction in Modern Standard Arabic that builds on previous work on resumption in Hausa (Crysmann, 2016). In addition to providing a more unified theory of the phenomenon in the two languages, the weight-based model of locality permits fine-grained control over the distribution of gaps and resumptives in a more principled way than what is offered by the case-based approach of Alotaibi and Borsley (2013). In particular, the weight-based approach provides for a more streamlined approach of locality constraints, while at the same time it permits avoiding percolation of under-motivated case assignment. Postulating a parochial "resumptive" filler-head construction for Modern

Standard Arabic not only solves the case issue, but it also derives why wh-fillers can escape strong islands, in contrast to Hausa, which only features standard filler-head structures with full local reentrancy. Finally, I proposed to relax the Coordination Constraint of Pollard and Sag (1994) in such a way as to permit selective full projection from one conjunct while ensuring minimal sharing on the other, a formulation which preserves the basic insights into ATB extraction, while permitting at the same time mismatch between gaps and resumptives.

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