

# Resumption and Case: a new take on Modern Standard Arabic

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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 (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, rather than offering alternative facts, I shall propose a reanalysis that improves on Alotaibi and Borsley (2013) in four areas: first, it resolves problems with case assignment in ATB extraction where there is a gap in one conjunct, and a resumptive in the other. Second, I shall show how the weight-based theory of islands developed in Crysmann (2012) can be parameterised to account for the MSA data as well. Finally, by adopting the underspecification approach advanced in Crysmann (2016), we shall reinstate a deterministic version of SLASH amalgamation, as well as provide identical semantics for gaps and resumptives.

## 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 (1) arguments of prepositions, as well as possessor arguments of nouns may only extract with a resumptive element in situ (a bound pronominal affix).<sup>1</sup>

- (1) a.  $\text{ʔayy -u/*-i}$   $\text{ɕaamiʕat-in}$   $\text{ðahaba}$   
which -NOM/-GEN university-GEN went.3SM  
Ahmad-u  $\text{ʔilai -ha / *∅}$  ?  
Ahmad-NOM to -it  
'Which university did Ahmad go to?' (A&B 2013, p. 7)
- b.  $\text{ʔayy -u/*-i}$   $\text{muʔallif-in}$   $\text{garaʔa}$   
which -NOM/-GEN author-GEN read.3SM  
Ahmad-u  $\text{kitaab-a -hu / *∅}$  ?  
Ahmad-NOM book-ACC -his  
'Which author's book has Ahmad read?' (A&B 2013, p. 7)

By contrast, non-nominal complements, e.g. PP-complements of verbs or adjectives may only extract by means of a gap strategy (see Alotaibi and Borsley, 2013, p. 11, for data and discussion).

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. (2), others feature the presence of a bound pronominal affix on the governing verb (3).

- (2)  $\text{ʔayy-a}$   $\text{T-tullaab-i}$   $\text{qaabala}$   
which-ACC the-students-GEN met.3SM  
 $\text{l-qaʔid-u}$   $\text{∅}$  ?  
the-leader-NOM  
'Which of the students has the leader met?' (A&B 2013, p. 8)
- (3)  $\text{ʔayy-u}$   $\text{T-tullaab-i}$   $\text{qaabala-hum}$   
which-NOM the-students-GEN met.3SM-them  
 $\text{l-qaʔid-u}$  ?  
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 (4). Furthermore, extraction out of strong islands, e.g. relative clauses make use of a resumptive obligatory.

- (4)  $\text{qaabaltu}$   $\text{rajul-an}$   $[\text{ʔaʕrifu -hu / *∅}]$  ?  
met.1SM man-ACC knew.1SM -him  
'I met a man that I knew' (A&B 2013, p. 9)
- (5)  $\text{ʔayy -u/*-a}$   $\text{bint-in}$   $\text{raʔaita}$   $\text{l-ʔasad-a}$   
which -NOM/-ACC girl-GEN saw.2SM the-lion-ACC  
 $\text{l-laðii}$   $\text{ʔakala -ha / ∅}$   
that ate.3SM -her  
'Which girl did you see the lion that ate?' (A&B 2013, p. 12)

<sup>1</sup>For reasons of space, I shall gloss over the possibility of pied piping which is immaterial for the points made here.

Case marking of fillers correlates with the choice of extraction strategy: while gaps feature 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 (6) parallels that of topicalised (7) and pro-dropped (8) subjects, in contradistinction to post-verbal subjects (9) in situ (partial agreement in person and gender).

- (6) ʔayy-u Tullaab-in ʕaraf-uu / \*ʕarafa  
 which-NOM students-GEN knew.3PM knew.3SM  
 l-ʔijaabat-a?  
 the-answer-ACC  
 ‘Which students knew the answer?’ (A&B 2013, p. 10)
- (7) T-tullaab-u qaabaluu / \*qaabala Ahmad-a  
 the-students-NOM met.3PM met.3SM Ahmad-ACC  
 ‘The students met Ahmad’ (A&B 2013, p. 9)
- (8) a. laqad qaabala Ahmad-a  
 indeed met.3SM Ahmad-ACC  
 ‘He met Ahmad.’ (A&B 2013, p. 10)  
 b. laqad qaabaluu Ahmad-a  
 indeed met.3PM Ahmad-ACC  
 ‘They met Ahmad.’ (A&B 2013, p. 10)
- (9) qaabala / \*qaabaluu T-tullaab-u Ahmad-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 both 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 (10).

$$(10) \left[ \begin{array}{l} \text{word} \\ \text{SLASH } \left\{ \left[ \begin{array}{l} \text{INDEX} \\ \text{ } \end{array} \right] \right\} \\ \text{ARG-ST } \left\langle \dots \left[ \begin{array}{l} \text{pro} \\ \text{INDEX} \end{array} \right] \dots \right\rangle \end{array} \right] \rightarrow \left[ \text{SLASH } \left\{ \left[ \begin{array}{l} \text{CASE} \\ \text{nom} \end{array} \right] \right\} \right]$$

Assignment is thus uniformly fixed at the bottom of the dependency, including 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 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* and the zero relative complementiser:

$$(11) \left[ \begin{array}{l} \text{PH} \quad \langle \text{llaði} \rangle \\ \text{HD} \quad \left[ \begin{array}{l} \text{comp} \\ \text{MOD NP} \left[ \begin{array}{l} \text{DEF} \quad + \\ \text{IND} \quad \bar{i} \end{array} \right] \end{array} \right] \\ \text{COMPS} \quad \left\langle \text{S} \left[ \text{SLASH} \left\{ \text{NP} \left[ \begin{array}{l} \text{IND} \quad \bar{i} \end{array} \right] \right\} \right] \right\rangle \end{array} \right]$$

$$(12) \left[ \begin{array}{l} \text{PH} \quad \langle \rangle \\ \text{HD} \quad \left[ \begin{array}{l} \text{comp} \\ \text{MOD NP} \left[ \begin{array}{l} \text{DEF} \quad - \\ \text{IND} \quad \bar{i} \end{array} \right] \end{array} \right] \\ \text{COMPS} \quad \left\langle \text{S} \left[ \text{SLASH} \left\{ \text{NP} \left[ \begin{array}{l} \text{CASE} \quad \text{nom} \\ \text{IND} \quad \bar{i} \end{array} \right] \right\} \right] \right\rangle \end{array} \right]$$

## 3 ATB and Case

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 (13): while the ATB constraint can be shown to be operative in the language, it apparently treats gap and resumptive dependencies alike.

- (13) a. \* man [tuhibu  $\emptyset$  wa tušaḩiʕu Ahmad-a  
 who like.2SM and support.2SM Ahmad-ACC  
 fii nafs-i l-waqt-iʕ  
 in same-GEN the-time-GEN  
 ‘Who do you like and support Ahmad at the same time?’ (A&B 2013, p. 13)

- b. man [tuhibu  $\emptyset$  wa tušađıfu  $\emptyset$  fii  
 who like.2SM and support.2SM in  
 nafs-i l-waqt-iŋ]  
 same-GEN the-time-GEN  
 ‘Who do you like and support at the same  
 time?’ (A&B 2013, p. 13)
- c. man [tuhibu  $\emptyset$  wa tušađıfu **-hu** fii  
 who like.2SM and support.2SM -him in  
 nafs-i l-waqt-iŋ]  
 same-GEN the-time-GEN  
 ‘Who do you like and support at the same  
 time?’ (A&B 2013, p. 14)’

Precisely for this reason, 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 (13), 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 [ (14b) ] with nominative case less acceptable, but do not generally reject them” (Alotaibi and Borsley, 2013, p. 21).

- (14) a. ?ayy -a Tullaab-in [qaabalta  $\emptyset$   
 which -ACC students-GEN met.2SM and  
 wa tahaddaŋta ?ilai-**hum**?  
 talked.2SM to-them  
 ‘Which students have you met and talked to?’  
 (A&B 2013, p. 21)
- b. ? ?ayy -u Tullaab-in [qaabalta  $\emptyset$   
 which -NOM students-GEN met.2SM and  
 wa tahaddaŋta ?ilai-**hum**?  
 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.

I shall argue, however, that case conflict in mixed gap/resumptive ATB constructions is not an inherent problem of MSA, but rather constitutes an artefact of the way Alotaibi and Borsley (2013) implement case assignment with resumptive dependencies, namely assignment to an element in SLASH at the bottom of the dependency and therefore transmission of this case requirement along the extraction path.

It is of note that MSA provides no evidence at all 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). Similarly, in ?anna clauses, which obligatorily involve resumption, the accusative requirement for the fronted NP is locally assigned by the complementiser ?anna, both for subject (zero pronoun) and object (pronominal affix) resumptives. Finally, the definite relative complementiser *llađi* indeed does inflect for case (in addition to number and gender), but case matching uniformly targets the antecedent, not the relativised argument (Alqurashi and Borsley, 2012, p. 29). Owing to the absence of a matching effect with resumptive dependencies, we can conclude that nominative case assignment at the bottom of the dependency is empirically undermotivated. It so happens that this is indeed the assumption that is at the root of the problem with ATB constructions.

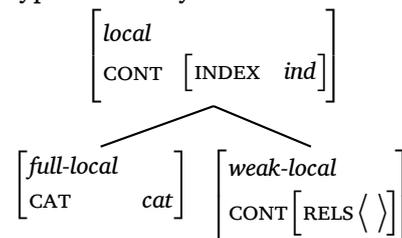
## 4 A reanalysis

In order to overcome the problems with case assignment in ATB constructions with mixed gap/resumptive dependencies, I shall propose that nominative case assignment to the filler in construction with resumptives is fixed directly at the top of the dependency. As for exerting more precise control over the distribution of gaps and resumptives, I shall rely instead on the weight-based theory of resumption and extraction developed in Crysmann (2016).

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

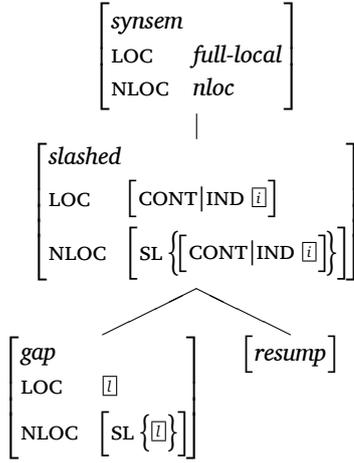
The weight-based theory of resumption and extraction implements a distinction of SLASH elements in terms of the amount of information that is minimally or maximally transmitted. As illustrated by the type hierarchy in (15), *local* values are differentiated according to the amount of information they 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 later type, cf. (16). As a consequence, *weak-local* values essentially live on non-local features, such as slash sets.<sup>2</sup> Reentrancy of an element with a LOC feature, as in the filler-head schema or for the type gap-synsem automatically coerces the element into the full type. The crucial point of this theory now is that resumptives by themselves are generally underspecified as to the local type on their SLASH set: all they require is minimal sharing of INDEX.

- (15) Types hierarchy of *local* values



- (16) Partial type hierarchy for *synsem* values

<sup>2</sup>See Crysmann (2013) for a similar proposal regarding locality constraints on complement clause vs. relative clause extraposition.



Without anything else being said, resumptives should be able to occur wherever a gap can. Most importantly, they are compatible with gaps in ATB constructions. Constructions which are selective for either gaps or resumptives can be captured straightforwardly by enforcing a particular local type on SLASH elements. For gaps, this typically arises by virtue of reentrancy with a LOC value, as it is the case for the filler-head schema. Restriction to a resumptive can occur at several points, e.g. by extraction islands or by the locally governing head (preposition, possessed noun), which may enforce stricter requirements: e.g. while complements of verbs only have the minimal restriction for INDEX reentrancy, ensuring compatibility with gaps and resumptives, complements of prepositions or the possessor complement of nouns can be explicitly restricted to have a SLASH element of type *weak-local*, thereby excluding gaps (see the examples in (1)).

## 4.2 Gaps and resumptives in MSA

To start with, I suggest that MSA provides two schemata to license (wh) fillers: the standard filler-head schema, which has full reentrancy between the filler's LOC value and an element in SLASH, as well as a parochial schema, that assigns the filler the unmarked case (nominative), and restricts feature percolation via SLASH to INDEX sharing.

$$(17) \left[ \begin{array}{l} \textit{filler-head-rule} \\ \text{SS} \quad \left[ \text{NLOC|SL } \textit{set(weak-local)} \right] \\ \text{F-DTR} \quad \left[ \text{SS|LOC } \boxed{i} \right] \\ \text{HD-DTR} \quad \left[ \text{SS|NLOC} \quad \left[ \text{T-B|SL} \quad \left\{ \boxed{i} \right\} \right] \right] \end{array} \right]$$

$$(18) \left[ \begin{array}{l} \textit{resump-filler-head-rule} \\ \text{SS} \quad \left[ \text{NLOC|SL } \textit{set(weak-local)} \right] \\ \text{F-DTR} \quad \left[ \begin{array}{l} \left[ \begin{array}{l} \text{HD } \textit{noun} \\ \text{SUBJ} \quad \langle \rangle \\ \text{COMPS} \quad \langle \rangle \\ \text{SPR} \quad \langle \rangle \end{array} \right] \\ \text{SS|L} \quad \text{CAT} \quad \text{VAL} \\ \left[ \begin{array}{l} \text{CONT} \quad \left[ \text{IND } \boxed{i} \right] \end{array} \right] \end{array} \right] \\ \text{HD-DTR} \quad \left[ \text{SS|NLOC} \quad \left[ \text{T-B|SL} \quad \left\{ \left[ \textit{weak-local} \right] \text{CONT|IND } \boxed{i} \right\} \right] \right] \end{array} \right]$$

In order to enforce that the bottom of the dependency in this construction involve a resumptive, I therefore constrain the element in SL(ASH) to be of type *weak-local*, thereby ruling out any gaps, which are *full-local* by necessity (see above).

Similarly, to account for the selectivity of the zero relative complementisers, we just need to replace the case constraint with a constraint pertaining to the local subtype on SLASH.

$$(19) \text{ Null indefinite relative complementiser} \\
\left[ \begin{array}{l} \text{PH} \quad \langle \rangle \\ \text{HEAD} \quad \left[ \begin{array}{l} \textit{comp} \\ \text{MOD } \bar{N} \quad \left[ \begin{array}{l} \text{DEF } - \\ \text{IND } \boxed{i} \textit{ref-index} \end{array} \right] \end{array} \right] \\ \text{COMPS} \quad \left\langle \text{S} \left[ \text{SLASH} \left\{ \left[ \textit{weak-local} \right] \text{CONT|IND } \boxed{i} \right\} \right] \right\rangle \end{array} \right]$$

The entry for *llađi* can remain largely unchanged. The only thing that differs is that we suppress the restriction to an NP *local* value on the SLASH element, which would be incompatible with *weak-local*. Selectiveness for nominal expressions derives instead from 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.

(20) Definite relative complementiser *llađi*

$$\left[ \begin{array}{l} \text{PH} \quad \langle \textit{llađi} \rangle \\ \text{HEAD} \quad \left[ \begin{array}{l} \textit{comp} \\ \text{CASE} \quad \boxed{c} \\ \text{MOD } \bar{N} \quad \left[ \begin{array}{l} \text{CASE} \quad \boxed{c} \\ \text{DEF} \quad + \\ \text{IND} \quad \boxed{i} \textit{ref-index} \end{array} \right] \end{array} \right] \\ \text{COMPS} \quad \left\langle \text{S} \left[ \text{SLASH} \left\{ \left[ \text{CONT|IND } \boxed{i} \right] \right\} \right] \right\rangle \end{array} \right]$$

With these changes in place, we are now in a position to almost trivially resolve the issue with case conflict in ATB constructions with mixed gap/resumptive dependencies, while maintaining in all other respects the restrictiveness of the original proposal. Central to the present take on MSA is the postulation of a language-specific filler-head rule that correlates constructional nominative case assignment to the filler with selection

for a *weak-local* UDC, effectively ruling out a gap at the bottom. As for selection of resumptive vs. gap strategies, I have replaced problematic case percolation with weight-based selection, a move which also opens up for the possibility to address island-sensitivity within the grammar, rather than delegating it to performance. Now that there is no case assignment at the bottom of resumptive dependencies, no conflict can ever arise between case requirements for gaps and resumptives: in essence, it is always the case of the gap that wins out. This not only reflects the absence of any observable matching effect with resumption, but it also corresponds to the perceived degradation associated with nominative as compared to accusative case.<sup>3</sup> Coordination of slashed constituents will always enforce the stronger constraint on the mother and both conjunct daughters, i.e. in coordination involving gaps and resumptives, the SLASH values of the mother and both daughters will be coerced to *full-local*, a specification that is compatible at the bottom of the dependency with both gaps (trivial) and resumptives (by underspecification). At the top, however, only the standard filler-head schema, but not the parochial “resumptive” filler-head structure, is compatible with this specification, thereby deriving the preference for case matching with the gap. Moreover, the present proposal does away with the rather stipulative nature of using case to regulate the distribution of resumptives vs. gaps, and replaces it with a more principled concept relating to the necessary amount of percolated information.

Applying the theory of resumption proposed in Crysmann (2016) has several advantages: first, it provides a unified analysis of resumption for Hausa and Arabic, a property that is highly desirable given the amount of parallelism in the constraints that both languages observe. The crucial differences between Hausa and MSA is actually encapsulated in a single place: MSA has a parochial filler-head rule that is compatible with resumptive dependencies, whereas Hausa does not. This is sufficient to derive the fact that in Hausa, only relativisation can escape strong islands (since the standard filler-head rule enforces *full-local*), whereas in MSA, this option is open to wh-fillers as well. The successful application of Crysmann (2016) to MSA further solves two somewhat more technical issues: SLASH amalgamation can be stated in a deterministic fashion and gaps and resumptives will receive identical semantics.

## 5 Conclusion

In this paper, I 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

<sup>3</sup>I specifically rule out the marginal example in (14b) as ungrammatical. Speakers clearly perceive the degradation, as stated by Alotaibi and Borsley (2013), and it is an often-made observation that second-language speakers (MSA is used as a vehicular language by speakers of different Arabic dialects) tend to have less sharp judgements, being more inclined to accept ungrammatical sentences.

way than what is offered by the case-based approach of Alotaibi and Borsley (2013). Not only does it generalise better from case languages like Modern Standard Arabic to case-less languages like Hausa or vernacular Arabic varieties, but it also avoids case conflict in ATB constructions with mixed gap/resumptive strategies. By postulating an additional 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.

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