Cross(over) My Heart and Hope to Bind

Matthew Hewett

1. Introduction

Much work since Borer (1981), Koopman (1984), and Engdahl (1985) has argued that two kinds of Ā-dependencies terminating in resumptive pronouns (i.e. *resumptive Ā-dependencies*) are distinguishable cross-linguistically: those which display the hallmarks of Ā-movement—most famously *island-sensitivity*—and those which do not but which behave instead like base-generated binding dependencies (see recently Sichel 2014, Scott 2021, and Georgi & Amaechi 2022). *Crossover effects* are commonly cited as evidence in favor of this bipartite taxonomy: movement-derived resumptive dependencies, but not base-generated ones, are claimed to be sensitive to crossover (see Koopman & Sportiche 1982, Sells 1984, Safir 1996, 2004, Demirdache & Percus 2011, and Korsah & Murphy 2020, a.o.).

In this paper, I argue that the conclusions of the previous literature, which were based exclusively on *primary* crossover effects, were confounded due to the fact that there is often no reliable way to distinguish the resumptive variable from the non-resumptive variables(s) in a primary crossover configuration. To get around this confound, I investigate *secondary* crossover (Postal 1993, Safir 1996), which disambiguates the Ā-bound resumptive variable through pied-piping. I present novel evidence from spoken Arabic varieties that secondary crossover effects are present under resumption. Crucially, secondary crossover effects persist with in-island resumption, demonstrating that (secondary) crossover is not an exclusive property of Ā-movement or of the binding of traces. Rather, secondary crossover effects derive from restrictions on Ā-binding dependencies, including base-generated ones. Specifically, I argue that secondary crossover is accounted for with a ban on indirect Ā-binding, building on work by Büring (2004).[1]

2. The ambiguity problem in testing primary crossover under resumption

Ā-movement famously displays weak and strong crossover (Postal 1971, Wasow 1972). The following gapped *wh*-questions from Iraqi Arabic illustrate:

(1) *Primary weak crossover in gapped* wh*-questions*
*ja: tˤa:lib$_i$ titwaqqaʕi:n umm-a$_i$ tri:d Hend tixta:r ___$_i$?
which student$_i$ think.2.F.SG mother-his$_i$ wants.3.F.SG Hend choose.3.F.SG
(int.) 'Which student$_i$ do you think his$_i$ mother wants Hend to choose ___$_i$?' (Iraqi)

(2) *Primary strong crossover in gapped* wh*-questions*
*ja: tˤa:lib$_i$ titwaqqaʕi:n huwwa$_i$ jri:d Hend tixta:r ___$_i$?
which student$_i$ think.2.F.SG he$_i$ wants.3.M.SG Hend choose.3.F.SG
(int.) 'Which student$_i$ do you think he$_i$ wants Hend to choose ___$_i$?' (Iraqi)

If the gap is replaced by a pronoun coconstrued with the *wh*-phrase, primary crossover effects disappear:

(3) *Primary weak crossover disappears in* wh*-questions with multiple bound pronouns*
ja: tˤa:lib$_i$ titwaqqaʕi:n umm-a$_i$ tri:d Hend tixta:r-a$_i$?
which student$_i$ think.2.F.SG mother-his$_i$ wants.3.F.SG Hend choose.3.F.SG-him$_i$
(lit.) 'Which student$_i$ do you think his$_i$ mother wants Hend to choose him$_i$?' (Iraqi)

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[1] Unless otherwise indicated, all facts hold for Iraqi, Tunisian, and Syrian Arabic.

(4) *Primary strong crossover disappears in* wh*-questions with multiple bound pronouns*
ja: t$^{\text{ʕ}}$a:lib$_i$ titwaqqaʕi:n huwwa$_i$ jri:d Hend tixta:r-a$_i$?
which student$_i$ think.2.F.SG he$_i$ wants.3.M.SG Hend choose.3.F.SG-him$_i$
(lit.) 'Which student$_i$ do you think he$_i$ wants Hend to choose him$_i$?' (Iraqi)

Similar observations made for other languages have prompted many researchers to claim that resumption can suspend otherwise expected crossover effects (e.g. Sells 1984, McCloskey 1990, Safir 1996, 2004, Sichel 2014), particularly in languages like Arabic where resumption freely violates islands ((5)).

(5) *Resumptive* wh*-questions can violate relative clause islands in Arabic*
ja: la:ʕibi:n$_i$ tħibbi:n [ajj aħħad jħibb-*(**hum**$_i$)]?
which players$_i$ like.2.F.SG any one likes.3.M.SG-*(**them**$_i$)
(lit.) 'Which players$_i$ do you like anyone who likes them$_i$?' (Iraqi)

However, there is a problem with concluding from (3)–(4) that resumption disarms crossover. Without a way to differentiate resumptive from non-resumptive pronouns,[2] it is not clear which of the two pronouns is Ā-bound by the operator (on this issue, see especially McCloskey 1990: 211–212, Demirdache 1991: 54–56, and Salzmann 2017: 195–197). As shown in (6)–(7), if the higher of the two pronouns functions resumptively, no crossover effects are expected ('RP' = resumptive pronoun):

(6) *Primary strong crossover configuration*

a. *Higher pronoun is resumptive → no primary strong crossover*
WH$_i$ [. . . RP$_i$ [. . . PRON$_i$ . . .]]
Ā-bind

b. *Lower pronoun is resumptive → primary strong crossover*
*WH$_i$ [. . . PRON$_i$ [. . . RP$_i$ . . .]]
Ā-bind

(7) *Primary weak crossover configuration*

a. *Higher pronoun is resumptive → no primary weak crossover*
WH$_i$ [. . . [XP . . . RP$_i$ . . .] [. . . PRON$_i$ . . .]]
Ā-bind

b. *Lower pronoun is resumptive → primary weak crossover*
*WH$_i$ [. . . [XP . . . PRON$_i$ . . .] [. . . RP$_i$ . . .]]
Ā-bind

Thus, the contrast between (1)–(2), on the one hand, and (3)–(4), on the other, is actually compatible with the hypothesis that resumption is uniformly subject to crossover.

3. Secondary crossover disambiguates the Ā-variable via pied-piping

I propose a novel method for diagnosing crossover under resumption which circumvents the aforementioned confound—namely, investigating *secondary crossover* (see Higginbotham 1980, 1983, Safir 1984, 1996, 1999, Postal 1993, and Bhatt & Keine 2019).[3] In secondary crossover, the phrase occupying the Ā-position is not the phrase lexically bearing the [wh]-feature, but is a phrase properly containing it (i.e. a phrase pied-piped by the *wh*-phrase). Consequently, the Ā-variable and the crossed pronoun are distinguishable via indexing: the Ā-variable is coindexed with the pied-piped phrase and the crossed pronoun is coindexed with the pied-piping *wh*-phrase. Secondary crossover corresponds to the failed coconstrual between the crossed pronoun and the pied-piping *wh*-phrase. The following Syrian gapped *wh*-questions illustrate:

[2] Resumptive pronouns are morphologically identical to non-resumptive pronouns in Arabic.

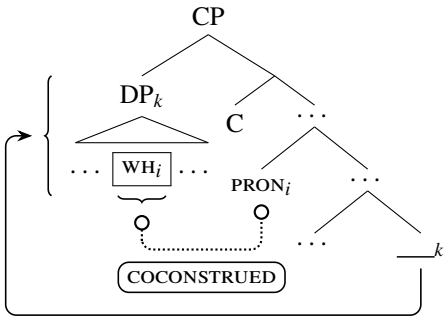
[3] The previous literature has sought to circumvent the ambiguity confound with primary crossover by ensuring that the higher of the two coindexed variables cannot be Ā-bound in its position. In languages with island-insensitive resumption, one common strategy since McCloskey (1990) has been to replace the higher pronoun with an epithet. But because there are independent constraints governing bound variable interpretations of epithets (see Malkawi 2009 and Hewett 2023), I set epithets aside here.

(8) *Secondary strong crossover effects are present in gapped Ā-dependencies*

a. * [uxt mi:n$_i$]$_k$ b-taʕtaʔidi {*pro$_i$* / huwwa$_i$} raħ jixta:r ___$_k$ li-l-liʕbi?
[sister who$_i$]$_k$ IND-think.2.F.SG { / he$_i$} FUT choose.3.M.SG for-the-game
(int.) '[Whose$_i$ sister]$_k$ do you think he$_i$ will choose ___$_k$ for the game?' (Syrian)

b. * [sajja:rat ajja wa:ħid$_i$]$_k$ xabbarit-u$_i$ l-ʃurtʕa inno liʔat ___$_k$?
[car which one.M.SG$_i$]$_k$ informed.3.F.SG-him$_i$ the-police.F.SG that found.3.F.SG
(int.) '[Which person$_i$'s car]$_k$ did the police imform him$_i$ that they found ___$_k$?' (Syrian)

c. *



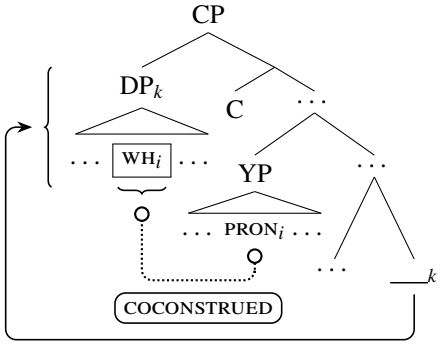
(9) *Secondary weak crossover are present in gapped Ā-dependencies*

a. * [fari:ʔ mi:n$_i$]$_k$ bi-taʕtaʔidi uxt-u$_i$ raħ tixta:r ___$_k$ li-l-liʕbi?
[team who$_i$]$_k$ IND-think.2.F.SG sister-his$_i$ FUT choose.3.F.SG for-the-game
(int.) '[Whose$_i$ team]$_k$ do you think his$_i$ sister will choose ___$_k$ for the game?' (Syrian)

b. * [sajja:rat ajja wa:ħid$_i$]$_k$ xabbarit l-ʃurtʕa ʕa:ʔilat-u$_i$ inno liʔat
[car which one.M.SG$_i$]$_k$ informed.3.F.SG the-police.F.SG family-his$_i$ that found.3.F.SG
___$_k$?

(int.) '[Which person$_i$'s car]$_k$ the police informed his$_i$ family that they found ___$_k$?' (Syrian)

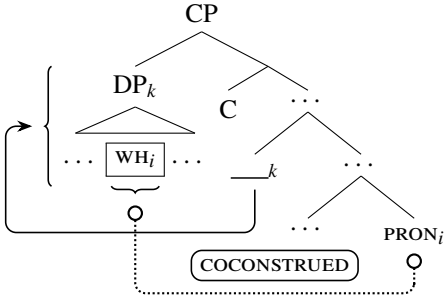
c. *



Like all crossover effects, the order of the two variables is crucial. If the positions of the Ā-variable and the pronoun coconstrued with the embedded *wh*-phrase are reversed, secondary crossover disappears:

(10) a. [uxt mi:n$_i$]$_k$ b-taʕtaʔidi ___$_k$ raħ tixta:r-u$_i$ li-l-liʕbi?
[sister who$_i$]$_k$ IND-think.2.F.SG ___$_k$ FUT choose.3.F.SG-him$_i$ for-the-game
'[Whose$_i$ sister]$_k$ do you think ___$_k$ will choose him$_i$ for the game?' (Syrian)

b.



Example (10) additionally shows that a *wh*-phrase properly contained inside a constituent in [Spec, CP] can be coconstrued with a pronoun in C′ that the *wh*-phrase itself does not c-command. Thus, the failure of coconstrual in (8)–(9) must be due to crossover and not a blanket failure of binding out of containers.

4. Secondary crossover effects are present under resumption in Arabic

In this section, I show that secondary crossover effects are also present in base-generated resumptive *wh*-questions in Arabic, contrary to what much of the previous literature leads us to expect.

4.1. DP pied-piping resumption: the baseline for testing secondary crossover

In order to test secondary crossover, however, it must first be shown that pied-piping and resumption are compatible. Although infrequently recognized in the resumptive literature, a DP which properly contains the lexical *wh*-phrase can appear in [Spec, CP] and bind a resumptive pronoun (for important precedents see Kayne 1983: 242, (64), Alber 2008: 150–152, and Sterian 2014); I refer to this as *DP pied-piping resumption*.[4] The Iraqi example in (11) illustrates with a pied-piping *wh*-possessor:

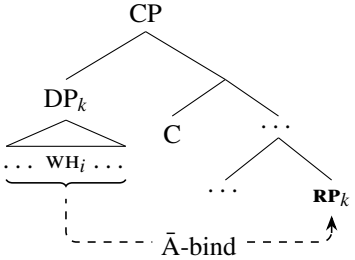
(11) [sˤu:rat minu$_i$]$_k$ ʕallago:-**ha**$_k$ ʕal-ħa:jitˤ?
[picture.F.SG who$_i$]$_k$ hung.3.PL-**it.F.SG**$_k$ on.the-wall
(lit.) '[Whose$_i$ picture]$_k$ did they hang it$_k$ on the wall?' (Iraqi)

Like all resumptive dependencies in Arabic, DP pied-piping resumption is island-insensitive ((12)–(13)), indicating that the pied-piped phrase is base-generated in [Spec, CP] and does not move there ((14)).

(12) *DP pied-piping with resumption (but not gaps) violates relative clause islands*
[sa:ʕat minu$_i$]$_k$ ma ligat l-ʃurtˤa l-ħara:mi lli ba:g-*(**ha**$_k$)?
[watch.F.SG who$_i$]$_k$ NEG found.3.F.SG the-police.F.SG the-thief that stole.3.M.SG-*(**it.F.SG**$_k$)
(lit.) '[Whose$_i$ watch]$_k$ did the police not find the thief who stole *(it$_k$)?' (Iraqi)

(13) *DP pied-piping with resumption (but not gaps) violates adjunct islands*
[sa:ʕat minu$_i$]$_k$ lizmat-itʃ l-ʃurtˤa bidu:n ma tbu:gi:-*(**ha**$_k$)?
[watch.F.SG who$_i$]$_k$ arrested.3.F.SG-2.F.SG the-police.F.SG without C steal.2.F.SG-*(**it.F.SG**$_k$)
(lit.) '[Whose$_i$ watch]$_k$ did the police arrest you without you stealing *(it$_k$)?' (Iraqi)

(14) *DP pied-piping resumption in Arabic involves a base-generated Ā-dependency*



See Hewett (2023) for additional evidence that resumptive Ā-dependencies in these varieties of Arabic never involve movement and are only formed via base-generation.

4.2. Secondary crossover in Arabic resumptive wh*-questions*

Having established that a pied-piped DP base-generated in [Spec, CP] can bind a resumptive pronoun, I now turn to secondary crossover effects under resumption. As the data in (15)–(16) show, Arabic resumptive *wh*-questions are subject to secondary weak and strong crossover.

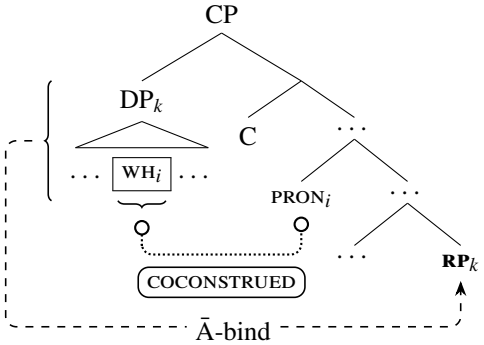
[4] I do not assume that pied-piping necessitates movement.

(15) *Secondary strong crossover effects are present in resumptive Ā-dependencies*

a. * [uxt mi:n$_i$]$_k$ b-taʕtaʔidi {*pro*$_i$ / huwwa$_i$} raħ jixta:r-**ha**$_k$ li-l-liʕbi?
[sister who$_i$]$_k$ IND-think.2.F.SG { / he$_i$} FUT choose.3.M.SG-**her**$_k$ for-the-game
(int.) '[Whose$_i$ sister]$_k$ do you think he$_i$ will choose her$_k$ for the game?' (Syrian)

b. * [sajja:rat ajja wa:ħid$_i$]$_k$ xabbarit-u$_i$ l-ʃurtʕa inno liʔat-**ha**$_k$?
[car which one.M.SG$_i$]$_k$ informed.3.F.SG-him$_i$ the-police.F.SG that found.3.F.SG-**it**$_k$
(int.) '[Which person$_i$'s car]$_k$ did the police inform him$_i$ that they found it$_k$?' (Syrian)

c. *

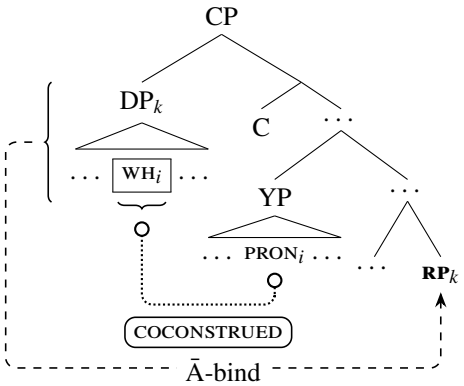


(16) *Secondary weak crossover are present in resumptive Ā-dependencies*

a. * [fari:ʔ mi:n$_i$]$_k$ bi-taʕtaʔidi uxt-u$_i$ raħ tixta:r-**u**$_k$ li-l-liʕbi?
[team who$_i$]$_k$ IND-think.2.F.SG sister-his$_i$ FUT choose.3.F.SG-**it**$_k$ for-the-game
(int.) '[Whose$_i$ team]$_k$ do you think his$_i$ sister will choose it$_k$ for the game?' (Syrian)

b. * [sajja:rat ajja wa:ħid$_i$]$_k$ xabbarit l-ʃurtʕa ʕa:ʔilat-u$_i$ inno liʔat-**ha**$_k$?
[car which one.M.SG$_i$]$_k$ informed.3.F.SG the-police.F.SG family-his$_i$ that found.3.F.SG-**it**$_k$
(int.) '[Which person$_i$'s car]$_k$ the police informed his$_i$ family that they found it$_k$?' (Syrian)

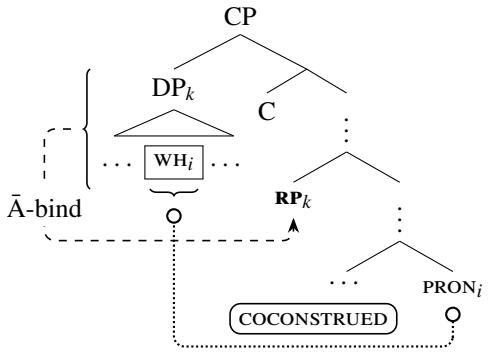
c. *



This is the first time such effects have been shown to hold in a language which utilizes base-generated resumption (see Martinović To appear for data illustrating that movement-derived resumption in Igala is also subject to secondary crossover). As with gaps (see (10)), secondary crossover disappears when the order of the two variables is reversed:

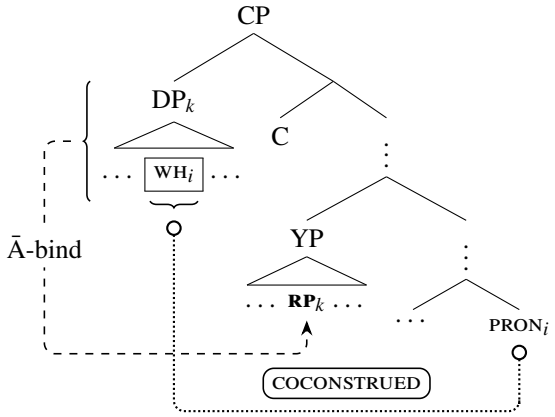
(17) a. [uxt mi:n$_i$]$_k$ b-taʕtaʔidi **hijja**$_k$ raħ tixta:r-u$_i$ li-l-liʕbi?
[sister who$_i$]$_k$ IND-think.2.F.SG **she**$_k$ FUT choose.3.F.SG-him$_i$ for-the-game
(lit.) '[Whose$_i$ sister]$_k$ do you think she$_k$ will choose him$_i$ for the game?' (Syrian)

b.



(18) a. [ħabiːbet miːn$_i$]$_k$ b-taʕtaʔidi ʔitʕtʕat-**ha**$_k$ bi-tħibb-u$_i$?
[girlfriend who$_i$]$_k$ IND-think.2.F.SG cat.F.SG-**her**$_k$ IND-like.3.F.SG-him$_i$
(lit.) '[Whose$_i$ girlfriend]$_k$ do you think her$_k$ cat likes him$_i$?' (Syrian)

b.



The fact that resumptive Ā-dependencies in Arabic are both island-insensitive and subject to (secondary) crossover undermines the classical intuition that crossover arises solely under movement (e.g. Postal 1971, Demirdache & Percus 2011).[5] Therefore, a defender of that intuition might be led to pursue a hybrid approach to Arabic resumption, following proposals by Aoun et al. (2001) and Sichel (2014), in which some resumptive Ā-dependencies are base-generated (e.g. in islands) and some resumptive Ā-dependencies are derived by movement (e.g. to induce secondary crossover). The problem with this approach is that it fails to account for secondary crossover effects with in-island resumption.

4.3. Secondary crossover inside islands in Arabic resumptive wh*-questions*

Secondary weak and strong crossover persist in Arabic when the resumptive pronoun is contained inside an island, whether or not the crossed pronoun is contained in the same island.[6] Consider first cases where the crossed pronoun is outside the island, as in (19).

(19) *Secondary strong (a) and weak (b) crossover effects with resumption in a relative clause island when the crossed pronoun is outside the island*

a. titðakkiriːn [uxut minu$_i$]$_k$ waʕadnaː-∅$_{*i/j}$ innu raħ nismaʕ ajj uɣnijja$_m$
remember.2.F.SG [sister who$_i$]$_k$ promised.1.PL-him$_{*i/j}$ that FUT listen.to.1.PL any song$_m$

[5] One widely adopted approach to the alleged linkage between crossover and movement argues that a single operator may not bind a trace and a pronoun in parallel (see e.g. Safir 1984, 1996 and van Urk 2015: 39). If trace-binding is only possible in a movement dependency, then crossover will only be expected under movement, since a base-generated dependency will uniformly trigger pronoun-binding.

[6] This is the first time such an observation has been made for any language, to my knowledge. For a related finding, see Salzmann (2017: 356–357), who argues that *primary* strong crossover does not pattern with locality in Swiss German (and see Hewett 2023: 334–342 for discussion of possible confounding factors with the Swiss German data).

{***pro***$_k$ / ?**hijja**$_k$} titˁalliʕ-ha$_m$?
{ / ?**she**$_k$} puts.out.3.F.SG-it$_m$
(lit.) 'Do you remember [whose$_i$ sister]$_k$ we promised him$_{*i/j}$ that we would listen to any song$_m$ she$_k$ puts it$_m$ out?' (Iraqi)

b. titðakkiriːn [firqat minu$_i$]$_k$ waʕadna ahl-a$_{*i/j}$ innu raħ nismaʕ
remember.2.F.SG [band who$_i$]$_k$ promised.1.PL family-his$_{*i/j}$ that FUT listen.to.1.PL
ajj uɣnijja$_m$ {***pro***$_k$ / ?**hijja**} titˁalliʕ-ha$_m$?
any song$_m$ { / ?**it**$_k$} puts.out.3.F.SG-it$_m$
(lit.) 'Do you remember [whose$_i$ band]$_k$ we promised his$_{*i/j}$ family that we would listen to any song$_m$ it$_k$ puts it$_m$ out?' (Iraqi)

The DP *uxut minu* 'whose sister' binds the resumptive pronoun 'she,'[7] which is contained in a relative clause island, and coindexation between the *wh*-possessor *minu* 'whose' and the crossed pronoun—'him' in (19a),[8] 'his' in (19b)—is ruled out. Crucially, secondary crossover cannot be attributed to movement of the container DP 'whose sister' from the position of the resumptive pronoun under the standard assumption that movement cannot escape islands (Ross 1967, Chomsky 1977).

Furthermore, positing Ā-movement only in the higher portions of the dependency which are outside the island containing the resumptive pronoun (i.e. positing a *mixed chain*, see Finer 1997, McCloskey 2002, Salzmann 2017, and Sportiche 2018, a.o.) also fails to account for the full range of crossover effects. As the examples in (20) illustrate, secondary crossover is still detectable when the crossed pronoun and the resumptive pronoun are contained within the same island. Any putative movement of the resumptive-binding operator from the edge of the island to its surface position would therefore not be expected to induce a crossover effect, contrary to fact.

(20) *Secondary strong (a) and weak (b) crossover effects with resumption in a relative clause island when the crossed pronoun is inside the same island*

a. *b-titzakkiri [ʃariːk ajja binit$_i$]$_k$ ma kənti ħaːdˁiri l-yom$_m$ lli
IND-remember.2.F.SG [partner which girl$_i$]$_k$ NEG were.2.F.SG present.F.SG the-day$_m$ that
ʕarrafnaː-ha$_i$ ʕaleː-∅$_k$ fiː-∅$_m$?
introduced.1.PL-her$_i$ to-**him**$_k$ in-it$_m$
(int.) 'Do you remember [which girl$_i$'s partner]$_k$ you were absent the day that we introduced her$_i$ to him$_k$?' (Syrian)

b. *b-titzakkiri [zoːʒ ajja binit$_i$]$_k$ ma kənti ħaːdˁiri l-yom$_m$ lli
IND-remember.2.F.SG [husband which girl$_i$]$_k$ NEG were.2.F.SG present.F.SG the-day$_m$ that
ʕarrafna ixwaːt-ha$_i$ ʕaleː-∅$_k$ fiː-∅$_m$?
introduced.1.PL siblings-her$_i$ to-**him**$_k$ in-it$_m$
(int.) 'Do you remember [which girl$_i$'s husband]$_k$ you were absent the day that we introduced her$_i$ siblings to him$_k$?' (Syrian)

I conclude that base-generated resumptive Ā-dependencies *are* subject to crossover, contra the claims and predictions of much previous literature (e.g. Doron 1982: 20–25, Sells 1984: 69–85, May 1985: 155–156, Safir 1986: 685, fn. 25, 1999: 614–615, 2004, 2019: 312–313, Cinque 1990: 151, McCloskey 1990: 236–238, Postal 1993: 553, Finer 1997: 714ff. Aoun & Choueiri 1999: 14–15, fn. 5, Boeckx 2003: 152–155, Asudeh 2012, Sichel 2014: 667–668, Georgi & Amaechi 2022: 7, Georgiou 2022, and Yip & Ahenkorah To appear, among many others).

4.4. Excursus: secondary crossover is not reducible to Condition C

Before presenting my analysis of secondary crossover in section §5, I briefly consider and reject an alternative account which seeks to reduce secondary strong crossover to Condition C reconstruction.

[7] The slight degradation seen with the overt subject resumptive pronoun *hijja* in both examples is due to a preference for pro-drop in the language.

[8] Despite the fact that it does not have an overt exponent, the 3.M.SG pronoun in (19a) can be detected by stem changes it induces in the preceding verb: the final vowel of the 1.PL agreement suffix *-na* undergoes lengthening and attracts primary stress before pronominal enclitics but remains short and unstressed elsewhere.

Strong crossover effects (both primary and secondary) have previously been analyzed as resulting from a Condition C violation under (obligatory) reconstruction of the *wh*-phrase to a position where it is c-commanded by a coindexed pronoun (see e.g. Chomsky 1981, Bhatt & Keine 2019, and Bruening 2021: 455–456). Adopting the Copy Theory of Movement (Chomsky 1993), the unacceptability of (21) is argued to follow from the fact that there is a representation of the *wh*-phrase *which girl* in a lower movement copy that is c-commanded by the coindexed pronoun *she*, thus paralleling the unacceptability of **She*$_{\text{i}}$ *wants you to hire Joni*$_{\text{i}}$*'s boyfriend* (unpronounced lower copies of movement are struck through).

(21) * [Which girl$_i$'s boyfriend] does she$_i$ want you to hire [~~which girl$_i$'s boyfriend~~]?

However, the Condition C reconstruction account of secondary crossover fails to account for the following contrast: Arabic resumptive Ā-dependencies display secondary strong crossover effects ((22a)) but nonetheless do not exhibit Condition C reconstruction effects with (non-*wh*) R-expressions ((22b)).

(22) a. *Resumptive* wh-*questions display secondary strong crossover effects*
[sˤu:rat mi:n tabaʕ ajja mumassili$_i$]$_k$ ħaket *pro*$_{*i/j}$ ʕale:-**ha**$_k$ kull l-yom?
[picture who of which actress$_i$]$_k$ talked.3.F.SG about-**it**$_k$ all the-day
(lit.) '[Whose picture of which actress$_i$]$_k$ did she$_{*i/j}$ talk about it$_k$ all day?' (Syrian)

b. *Resumptive* wh-*questions do not display Condition C reconstruction with R-expressions*
[sˤu:rat mi:n tabaʕ Joni$_i$]$_k$ ħaket {*pro*$_i$ / hijja$_i$} ʕale:-**ha**$_k$ kull l-yom?
[picture who of Joni$_i$]$_k$ talked.3.F.SG { / she$_i$} about-**it**$_k$ all the-day
(lit.) '[Whose picture of Joni$_i$]$_k$ did she$_i$ talk about it$_k$ all day?' (Syrian)

Moreover, even if the Condition C reconstruction account were modified to explain this contrast, it would fail to extend to secondary *weak* crossover under resumption (see (16)) where no Condition C effect is expected. Thus, secondary crossover under resumption in Arabic is not reducible to Condition C.

5. Deriving secondary crossover from a ban on indirect Ā-binding

The primary empirical discovery of this paper is this: resumptive Ā-dependencies in Arabic exhibit secondary strong and weak crossover effects, even when the resumptive pronoun is in a position inaccessible to movement (e.g. an island). An empirically adequate account of this discovery must therefore derive secondary crossover from general constraints on Ā-binding—which is present in all Ā-dependencies—and not from constraints specific to Ā-movement or the binding of traces.

To that end, I propose that variation along two dimensions yields three, but not four, types of binding, as summarized in (23)–(25). On the one hand, binding can take place either from an A-position (i.e. A-binding) or from an Ā-position (i.e. Ā-binding).[9] On the other hand, the binder can either c-command its bindee (i.e. *direct* binding) or the binder can be contained in a phrase which c-commands its bindee (i.e. *indirect* binding). Crucially, I propose that indirect binding from an Ā-position is not possible ((26)).

(23) **Direct A-binding**

a. The QP occupies an A-position and c-commands the gap/pronoun it is coconstrued with.

b. ma xabbarna wala wa:ħid$_i$ innu raħ nwazˤzˤif-u$_i$.
NEG informed.1.PL no one.M.SG$_i$ that FUT hire.1.PL-him$_i$
'We didn't inform anyone$_i$ that we would hire him$_i$.' (Syrian)

(24) **Indirect A-binding**

a. A DP properly containing the QP occupies an A-position and c-commands the pronoun the QP is coconstrued with.

b. ma xabbarna [umm wala wa:ħid$_i$]$_k$ innu raħ nwazˤzˤif-u$_i$.
NEG informed.1.PL [mother no one.M.SG$_i$]$_k$ that FUT hire.1.PL-him$_i$
'We didn't inform [anyone$_i$'s mother]$_k$ that we would hire him$_i$.' (Syrian)

[9] Although I state my account in terms of A- vs. Ā-positions, it can be easily adapted to analyses like that of van Urk (2015) which dispense with the positional A-/Ā-distinction in favor of a featural distinction (e.g. binding triggered by an A-feature vs. binding triggered by an Ā-feature).

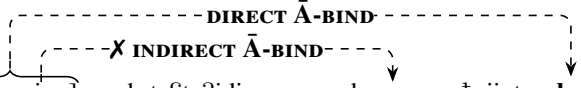
(25) **Direct Ā-binding**

a. The QP occupies an Ā-position and c-commands the gap/resumptive it is coconstrued with.

b. ajja wa:ħid$_i$ {xabbartu ___$_i$ / xabbartu:-∅$_i$} innu raħ nwaz^{ʕ}z^{ʕ}if-kon?
which one$_i$ {informed.2.PL / informed.2.PL-**him**$_i$} that FUT hire.1.PL-you.2.PL
'Which one$_i$ did you inform {___$_i$ / him$_i$} that we would hire you?' (Syrian)

(26) *A definition for indirect Ā-binding, which does not exist by hypothesis*

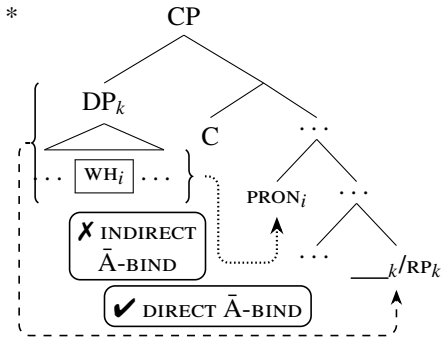
a. A DP properly containing the QP occupies an Ā-position and c-commands the pronoun the QP is coconstrued with.



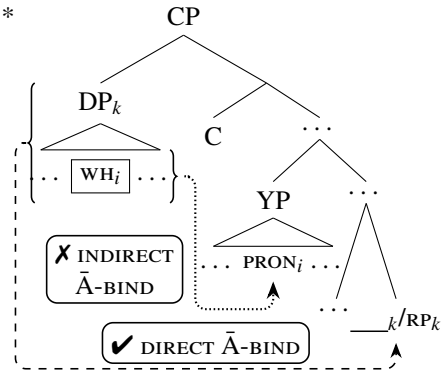
b. *[uxt mi:n$_i$]$_k$ b-taʕtaʔidi huwwa$_i$ raħ jixta:r-**ha**$_k$?
[sister who$_i$]$_k$ IND-think.2.F.SG he$_i$ FUT choose.3.M.SG-**her**$_k$
(int.) '[Whose$_i$ sister]$_k$ do you think he$_i$ will choose her$_k$?' (Syrian)

Because of this proposed ban on indirect Ā-binding, there will be no possible route to coconstrual between the embedded *wh*-phrase and the crossed pronoun in a secondary crossover configuration like (27) or (28), whether the Ā-dependency was formed by movement or by base-generation.

(27) ***Secondary strong crossover violation***

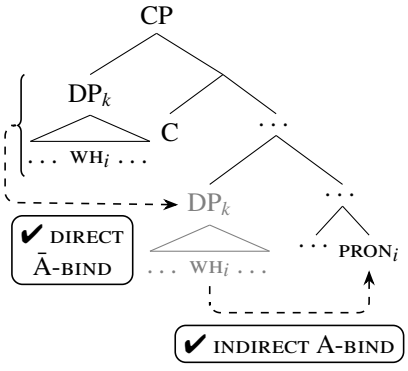


(28) ***Secondary weak crossover violation***

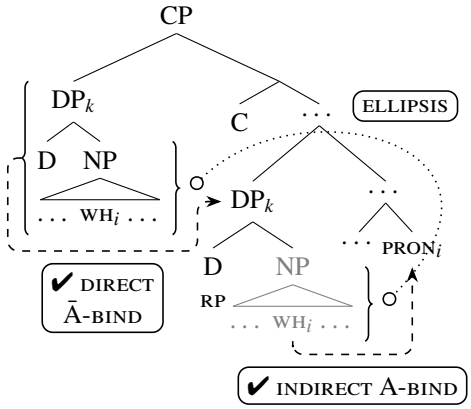


Furthermore, I propose that the availability of indirect binding from an A-position is what accounts for the avoidance of crossover when the order of the Ā-variable and the crossed pronoun is reversed (see (10), (17)–(18)). With gaps, the indirect A-binder is an unpronounced copy of the moved *wh*-operator ((29a)). With resumptive pronouns, I propose that the indirect A-binder is an operator identical to the antecedent which is deleted under NP-ellipsis with the NP in [Spec, CP] ((29b)); that is, resumptive pronouns are hidden definite descriptions, following proposals in Guilliot & Malkawi (2006) and Salzmann (2017).

(29) a. *Indirect A-binding by a lower copy of Ā-movement*



b. *Indirect A-binding by a resumptive*



Note that, if indirect Ā-binding existed, we would have no explanation as to why (27)–(28) are illicit, in contrast to (29).

The ban on indirect Ā-binding receives some preliminary support from Daniel Büring's work on the semantics of crossover. Büring (2004) posits three kinds of syntactically represented binder prefixes, whose distribution predicts precisely the three-way taxonomy of binding types I have proposed in this paper. Crucially, the binder responsible for indirect binding in Büring's system—Σ (mnemonic for 'situation', as it triggers binding of a situation variable)—is restricted to adjoining to the sister of an A-position.[10] Thus, there can be no indirect binding from an Ā-position. This insight from the semantics literature on crossover helps to shed light on hitherto unrecognized secondary crossover effects in base-generated Ā-dependencies. See Hewett (2023: ch. 7) for extended discussion.

6. Conclusion

In this paper, I documented a novel empirical discovery: resumptive Ā-dependencies in Arabic exhibit secondary crossover effects. Moreover, because secondary crossover persists with resumption inside islands, I concluded that crossover cannot exclusively be linked to Ā-movement or to the binding of traces. Rather, crossover characterizes Ā-binding dependencies generally, including base-generated ones. This finding runs counter to the claims and predictions of much earlier work which focused exclusively on primary crossover effects under resumption and which I showed to be confounded. I argued that secondary crossover is accounted for if operators cannot bind out of phrases which properly contain them in Ā-positions (i.e. if there is no indirect Ā-binding). Although this ban on indirect Ā-binding is, at present, an irreducible stipulation of my account, it clearly ought to emerge from deeper features of grammar (see footnote 10 for one suggestion). This question remains the topic of future work.

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[10] If we focus on [Spec, CP] from among the set of Ā-positions, then the ban on situation variable binding from an Ā-position (i.e. the ban on indirect Ā-binding) might be attributable to independent semantic restrictions on where in the clausal spine situations come into play. In their tripartite semantic decomposition of the clause, Ramchand & Svenonius (2014) argue that situations are characteristic of the T-domain. We could speculate, then, that situation binding from [Spec, CP] is ruled out because all situation variables will have been closed off at the point at which C is reached (see especially Ramchand & Svenonius 2014: 164).

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