Universal Grammar:
Multiple Strategies to Construct Relative Clauses

Gramática Universal:
Estrategias Múltiples para la Construcción de Cláusulas Relativas

Ager Gondra Astigarraga

Purchase College –SUNY

Ager.Gondra@purchase.edu

Resumen: *El enfoque generativista asume que las lenguas en todo el mundo comparten un conjunto común de propiedades abstractas que ha sido denominado Gramática Universal (GU). Este enfoque tiene como principal objetivo encontrar generalizaciones entre diferentes idiomas, mientras que al mismo tiempo trata de descifrar los parámetros que hacen que una lengua difiera de otra. En este trabajo se corrobora esta idea generativista analizando la representación sintáctica de la cláusula relativa del cantonés, chaoshan, jordano, turco y español. De esta manera, se establecen los procesos y mecanismos sintácticos activos en la formación de las cláusulas relativas. Más concretamente, se demuestra que la GU ofrece dos estrategias sintácticas para construir oraciones de relativo: la estrategia ascenso de núcleo y la estrategia núcleo externo con el movimiento del operador o con el operador in situ. Asimismo, se concluye que la GU puede ofrecer las dos estrategias a un mismo idioma.*

Palabras clave: *Sintaxis, Cláusulas Relativas, Análisis Núcleo Externo, Análisis Ascenso de Núcleo*

Abstract: *The generativist approach follows the idea that languages across the world share a common set of core abstract properties that has been named Universal Grammar (UG). Its main goal is to find generalizations among different languages, while at the same time attempting to decode the parameters that make one language differ from another. This paper seeks to add to this generativist idea by analyzing the syntactic representation of relative clauses (RC) in Cantonese, Chaoshan, Jordanian Arabic, Turkish and Spanish. By doing so, it establishes the syntactic processes and mechanisms active in the derivation of the RC construction that UG allows. More concretely, it shows that UG provides languages with two syntactic strategies to construct RCs: the head raising strategy and the head external strategy with operator movement or in situ. Additionally, the paper concludes that UG can offer both strategies to the same language.*

Keywords: *Syntax, Relative Clause, Head External Analysis, Head Raising Analysis*

1. Introduction

The Head Raising Analysis and the Head External Analysis have been in constant competition under the assumption that a single relative clause (RC) analysis for all languages is possible, which would mean that Universal Grammar (UG) only offers one strategy to build relative constructions (Carlson, 1977; Grosu and Landman, 1998). However, Aoun and Li (2003) argue the need to distinguish different types of analyses within and, as well as, across languages.

This study provides crosslinguistic evidence that shows that UG offers two strategies to construct relative clauses: the head raising strategy (1) and the head external strategy with operator movement (2a) or with base-generated operator (2b):

(1)   [$_{DP}$ D [$_{CP}$ DP$_i$ [$_{C'}$ [$_{TP}$ . . . ~~DP$_i$~~ . . .]]]]

(2)   a. [$_{DP}$ [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . ~~Op$_i$~~ . . .]]]]

         b. [$_{DP}$ [$_{NP}$ [$_{N'}$ Ni . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . e_i . . .]]]]

Specifically, this study analyzes the syntactic properties of RCs in Cantonese, Chaoshan, Jordanian Arabic, Turkish and Spanish[1], and concludes the following: (i) Cantonese, Chaoshan and Turkish use the head raising strategy, (ii) Jordanian Arabic uses the head external strategy, and (iii) Spanish uses both strategies. It also establishes that UG provides two structures not only across but also within languages.

2. Theoretical Framework

This section presents the two analyses standardly accepted for relative clauses within the generative framework: the Head External Analysis (Chomsky, 1977) and the Head Raising Analysis (Schachter, 1973; Vergnaud, 1974; Kayne, 1994; Borsley, 1997; Bianchi, 1999, 2000).

2.1. The Head External Analysis

Chomsky (1977) proposes the Head External Analysis for the internal syntax of relative construction. In this analysis, RCs are CPs adjoined to the base-generated external N head, which is selected by the determiner head. In addition, based on the syntactic similarities that RCs and Wh-interrogatives have (3), Chomsky claims that relative constructions and Wh-interrogatives derive via A'-movement.

(3)   a. The construction contains a gap.

         b. Long distance relations are available.

         c. Island constrains are relevant.

How RCs and Wh-interrogatives share these properties in (3) can be seen in (4a-c), and (5a-c):

(4)   a. Who$_i$ did John say [~~who$_i$~~ [Mary will visit ~~who~~ $_i$?]]

         b. The girl [who$_i$ John said [~~who$_i$~~ [Mary will visit ~~who$_i$~~]]]

         c. The girl [Op$_i$ John said [~~Op$_i$~~ [Mary will visit ~~Op~~ $_i$]]]

(5)   a. *Who$_i$ did John asked [why [Mary gave the apple ~~who$_i$~~?]]

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b. *The girl [who$_i$ John asked [why [Mary gave the apple to ~~who$_i$~~]]]

c. *The girl [Op$_i$ John asked [why [Mary gave the apple to ~~Op~~ $_i$]]]

First, in (4a-c) and (5a-c) the Wh-/null-operator has moved to Spec-CP positions leaving a gap in its base-generated position. Second, there is a long distance dependency between this gap and the Wh-/null-operator. Third, both RCs and Wh-interrogatives are subject to island constraints as the ungrammaticality in (5a-c) shows. Thus, the RC analysis proposed by Chomsky is represented as follows:

(6)   [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . ~~Op~~$_i$ . . .]]]

As shown in (6), RCs are CPs adjoined to the base-generated external N head, which is selected by the determiner head. Additionally, the operator has two functions. First, the operator is interpreted with the N head outside the relative clause via a predication rule. Second, following the operator-variable analysis, the operator binds a variable in the gap position.

Overfelt (2009) analyzes this operator-variable binding in languages that do not show island constraints in RC formation. In the following Tigryina example (7), if the operator had moved from within the lowest CP, which is an island, the sentence would be ruled out. Yet, it is not.

(7)   ʔiti [$_{CP}$ Op$_i$ [$_{TP}$ Nahor [$_{CP}$ siləmintaj *e*$_i$ nəta   dəbdabe

        that-ms   Nahor   why   *e* that-fs.ACC letter-fs

        tsiħifuwa   ʔilu]   zigrom]]
        write=GER-S3ms-o3fs   AUX=s3ms   REL=wonder=GER-s3ms man-ms

        səbʔaj   nəwiħ ʔiju
        tall-ms   Cop=s3ms

        Intended: 'The man that Nahor wonders why wrote the letter on
              Monday is tall'

Overfelt (2009) proposes that in the External Head Analysis the operator can show two behaviors: either the operator moves to Spec-CP (8a) or it is directly generated in Spec-CP from which it binds a resumptive pronoun in the form of *pro* occupying the gap position (8b).

(8)   a. [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . ~~Op~~$_i$ . . .]]]

        b. [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . *e*$_i$ . . .]]]

2.2. The Head Raising Analysis

Under the Head Raising Analysis, the head of the RC is base-generated inside the TP and moves to the specifier position of the CP, be it overtly in the syntactic component or covertly in the LF component[2] (de Vries, 2002). Moreover, this analysis rules out right adjunction, and instead it suggests the complementation structure. Kayne (1994) proposes the following structure:

(9) $[_{DP} \text{ D } [_{CP} \text{ NP}_i [_{C} [_{TP} \ldots \text{ } \cancel{\text{NP}}_i \ldots]]]]$

Reconstruction effects played the most prominent role for proposing that the head of the relative construction is moved from within the relative clause instead of being base-generated outside of it (Schachter, 1973; Vernaud, 1974; Kayne, 1994). Assuming that certain elements are required to hold specific structural relationships with other elements, reconstruction is used as a diagnostic test for movement since it identifies the structural relationship between these elements prior to a movement operation. First evidence in favor of reconstruction of the head of the relative clause comes from idiom chunk interpretation. Verb-object idiomatic expressions, such as (10a-b) require a local relationship between the verb and the object in order to maintain the idiomatic reading.

(10) a. She is *keeping track* of her expenses.

b. Mel *made headway.*

What makes possible for *keeping track* (10a) and *made headway* (10b) to have an idiomatic reading in the sentence is their local relationship. In other words, *track* and *headway* cannot be generated independently from *keeping* and *made* respectively, but as a unit. Now consider the examples (11a-b) with a relative construction, where, on the surface, there is no local relationship between the verb and the object since this last one is in the main clause and the verb is inside the RC:

(11) a. The careful *track* that she's *keeping* on her expenses pleases me.

b. The *headway* that Mel *made* was impressive.

(Schachter, 1973: 31-32)

In these sentences (11a-b), *keeping track* and *made headway* clearly remain their idiomatic reading. For the idioms to be properly interpreted, the head of RC has to be reconstructed into the relative clause to form a unit with the verb. Hence, the Head Raising Analysis adequately accounts for the distribution of idioms in RCs (Schachter, 1973; Vergnaud, 1974; Bianchi, 1995; Alexiadou *et al.*, 2000; Bhatt, 2002; Aoun and Li, 2003).

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2 This analysis is able to also capture the nature of the internally headed relative clauses where the head of the relative clause does not undergo movement but stays in-situ.

The second evidence comes from scope interaction. A relative clause head with an existential quantifier can be interpreted as having narrow scope with respect to a universal;quantifier within the relative clause (Bianchi, 1995, 1999; Alexiadou *et al.* 2000; Bhatt, 2002; Aoun and Li, 2003).

(12)   a. Every doctor will examine two patients.

      b. I phoned the two patients that every doctor will examine tomor-
        row.

(Aoun and Li, 2003: 98)

Sentence (12a) has the universal quantifier *every* higher than the existential *two* respect the structural position, which allows the former to take scope over the other. Thus, QP *two patients* has both wide and narrow scope with respect to the subject *every doctor,* that is, either each doctor treats two patients, or all of them treat the same two. In (12b), it can be observed that even though the head of the RC is higher than the subject of the embedded clause it can still get both interpretations as in (12a). Since the subject can get scope over the head, this indicates that there has been a movement of the head from the object position of the embedded clauses.

In brief, scope interaction, and the idiom chunks provide evidence that reconstruction takes place. Thus, the Head Raising Analysis predicts correctly that the head raises to build a relative construction. According to Kayne (1994), this head is an NP and the D that can be seen with the head in the surface position is originated external to the RC (9). Nevertheless, Borsley (1997) argues that the constituent that raises cannot be an NP because NPs are predicates, and arguments are considered DPs (Longobardi, 1994). Building on this claim, Bianchi (1999, 2000) suggests that what it is moved is a DP with a phonologically null D, which has to be licensed by the external D of the relative construction. Likewise, the external D needs to be interpreted with an NP, which indeed it is interpreted with the complement of the null determiner. Thus, these two D-heads show a double-edged relation. An example is provided in (13):

(13)   [DP [D the [CP [DP Æ apple]ᵢ [C′ that [TP the woman ate ~~Æ appleᵢ~~]]]]]

In (13) the head *Æ apple* is in the peripheral position of the CP providing the external determiner *the* an NP to be interpreted with, in addition to licensing the null determiner Æ. Bianchi explains that this double function is achieved by incorporation of both D-heads, that is, they become one unified entity, and this can only happen when they are both adjacent to each other.

3. Crosslinguistic Evidence

The following crosslinguistic study, in which the syntactic properties of RCs in Cantonese, Chaoshan, Jordanian Arabic, Turkish and Spanish are analyzed[3], show that UG provides languages with two syntactic strategies to construct such clauses: the head raising strategy (14), and the head external strategy (15a-b). It also provides evidence to claim that the same language can use both structures.

(14) [$_{DP}$ D [$_{CP}$ DP$_i$ [$_{C'}$ [$_{TP}$ . . . $\overline{DP_i}$ . . .]]]]

(15) a. [$_{DP}$ [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . $\overline{Op_i}$ . . .]]]]

b. [$_{DP}$ [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . e_i . . .]]]]

In (14) the CP is the complement of a D-head, and the head of the relative clause is base-generated inside the TP and moves to the specifier position of the CP. In (15a-b), the head is external and takes the CP as an adjunct. The operator, which is interpreted with the head outside the Relative Clause via an agreement relation (Chosmky, 1977) or predication rule (Browning, 1989), may have two different be-haviors. (15a) shows an operator movement to the Spec-CP position leaving a gap in its base-generated position, whereas (15b) shows an operator base-generated in the Spec-CP, from which it is co-indexed with a variable.

The following sentences (16a-f) show RCs in Cantonese, Chaoshan, Turkish, Jordanian Arabic and Spanish. Notice that (16e) has a RC with a Wh- while (16f) has a RC with the complementizer *que* 'that' (16f).

(16)

[Cantonese]

a. ngo   tai-gin [tung   ngo sik   fan go2   go3 leoi-jan].

1sg   see   with   1sg. eat   rice   D.that CL woman

'I saw the woman that ate rice with me.'

[Chaoshan]

b. [bi   zi-bau   gai   no-gia]   lai-dzio.

   carry   book-bag   DE   child   come-past

'The child who was carrying a book-bag came here.'

[Turkish]

c. Ben [anne-m-in   pişir-diğ-i   yemeğ-i]   ye-di-m.

   I   mother-poss1-gen1   cook-DIK-poss3   food-ACC   eat-past-1s

'I ate the food that my mom cooked'

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3 Native speaker introspection and grammaticality judgment under direct elicitation are used in this study.

[Jordanian Arabic]

    d. Bna3rif   [l-mara   lli gaabl-ha   Karim].

     Know.prst1p the-woman   that meet:PRF:3sm-her Karim

    'We know the woman that Karim met (her).'

[Spanish]

    e. [Las personas con las cuales trabajamos] son del País Vasco.

    f. [Las personas con las que trabajamos] son del Páis Vasco.

This section is split into two parts. The first subsection analyzes the behavior of the head of the RC in order to distinguish the languages that show the Head Raising Analysis from those that show the Head External Analysis. The second subsection analyzes the nature of the operator to identify which languages, among those that show the Head External Analysis, have the operator base-generated in the Spec-CP position and which ones have an operator movement to the Spec-CP.

3.1. Headedness

In the Head Raising Analysis the head of the relative clause is base-generated inside the TP from where it undergoes movement to the specifier position of the CP. The movement option is conceptualized below in (17).

(17) XP_i $[_{CP} \; \overline{XP_i} \;]$

In the External Head Analysis the head noun is base-generated in its surface position, that is, outside the CP, and is related to an operator within the relative clause. This can be represented as in (18).

(18) N_i $[_{CP} \; Op_i \;]$

In the following, syntactic tests related to idioms and scope interaction that focus on the local structural relation between the head of the RC and the elements inside the TP are applied. If such local relation is observed, it can be inferred that the head of the RC was base-generated inside the TP and underwent movement to its surface position as (17) shows. However, if such relation is not observed, it can be concluded that the head of the RC was directly base-generated in its surface position as shown in (18).

3.1.1. Idioms

A very well known argument against the assumption of a base-generated external head concerns idiom expressions (Schachter, 1973; Vergnaud, 1974; Alexiadou *et al*. 2000). The idiom test is based on the assumption that verb-object idiomatic expres-

sions, such as in (19a-f), require a local relationship between the verb and the object in order for the idiomatic reading to arise.

(19)

[Cantonese]

      a. Keoi   ceoi   seoi

        He   blow   water

        'He talks nonsense' (Lit:'He blows water')

[Chaoshan]

      b. i   dui   sim-kuan

        He pat   heart

        'He got anxious' (Lit:'He patted his heart')

[Turkish]

      c. Proje   yol   al-di

        project road take.pst

      'The project made progress' (Lit:'The project took the road')

[Jordanian Arabic]

      d. Ayman xazag   3ein-ha   la-leila

        Ayman puncture.ps3s   eye-her   la-Leila

        'Ayman embarrassed Leila (in front of others)' (Lit:'Ayman punctured Leila's eye')

[Spanish]

      e. El alumno le hace la pelota al maestro.

        'The student butters the teacher up'

     If these idioms (19a-e) maintain their idiomatic reading after relativizing the object, it can be concluded that the head of the RC was generated as the object of the RC-verb. Nonetheless, if the idiomatic reading is lost, it means that a local relation between the object the verb never existed. Thus, this indicates that the head did not undergo movement from within the embedded clause but that it was originated in its surface position. Let's consider the following examples in which the object is relativized (20a-f):

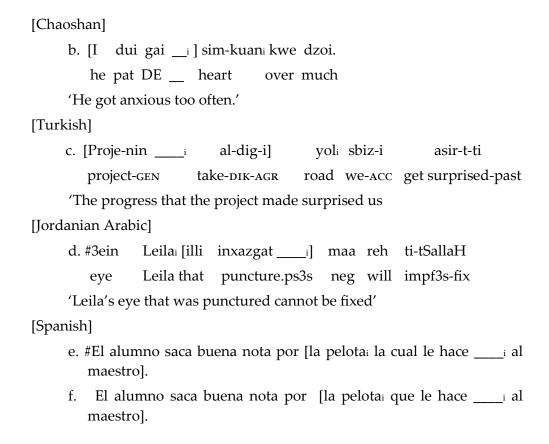(20)

[Cantonese]

      a. Nei   m   hoji tang [keoi   ceoi   ge[4] ___$_i$] seoi$_i$

        You   neg   can   listen he   blow C   water

      'You cannot listen to the nonsense he says'

_____

4 As noted in Yu (2006), Mandarin *de* is direct equivalent of Cantonese *ge*; and Mandarin also has separate determiner that shows parallel distribution for RC.

[Chaoshan]

   b. [I   dui gai __ᵢ] sim-kuanᵢ kwe dzoi.

     he pat DE __   heart   over much

   'He got anxious too often.'

[Turkish]

   c. [Proje-nin ____ᵢ   al-dig-i]   yolᵢ sbiz-i   asir-t-ti

     project-ɢᴇɴ   take-ᴅɪᴋ-ᴀɢʀ   road we-ᴀᴄᴄ get surprised-past

   'The progress that the project made surprised us

[Jordanian Arabic]

   d. #3ein   Leilaᵢ [illi   inxazgat ____ᵢ]   maa reh   ti-tSallaH

     eye   Leila that   puncture.ps3s   neg will impf3s-fix

   'Leila's eye that was punctured cannot be fixed'

[Spanish]

   e. #El alumno saca buena nota por [la pelotaᵢ la cual le hace ____ᵢ al maestro].

   f. El alumno saca buena nota por [la pelotaᵢ que le hace ____ᵢ al maestro].

Notice that sentences (20a-c) and (20f) retain their idiomatic meaning, whereas (25d) and (25e) do not. The fact that the idiomatic reading is kept in (28a-c) and (28f) is an indication that the head of the RC was originated in a local relation with the RC-verb, and therefore, that Cantonese, Chaoshan, Turkish and Spanish (for that- RCs) use the head raising strategy. The felicitousness of (20d) and (20e), on the other hand, indicates that the head of the RC was not originated in a local relation with the RC-verb, and therefore, that Jordanian Arabic and Spanish (for Wh- RCs) use the head external strategy. In addition, Spanish (20e-f) examples support Aoun and Li's (2003) claim that a single language can use both strategies: in Wh- RC (20e) the head is externally originated, while in that- RC (25f) it rises to its surface position.

3.1.2. Scope interaction

Further evidence for head-reconstruction comes from scope interaction (Bianchi, 1995, 1999; Alexiadou *et al.* 2000; Bhatt, 2002; Aoun and Li, 2003). The following examples (21a-e) contain an existential quantifier within the object, which can be interpreted as having narrow scope ($\exists > \forall$) or wide scope ($\forall > \exists$) with respect to the universal quantifier within the subject.

(21)

[Cantonese]

    a. keoi   gin-dou   mui-go hok-saang   tai-gwo ge   loeng bun syu

       s/he   see   every   student   read   GE two   CL book

    'She saw the two books that every student red'

           i. saam go beng-jan > mui-g ji-sang   √∃>∀

           ii. mui-g   ji-sang > saam go beng-jan   √∀>∃

           √ distributive; √ collective

[Chaoshan]

    b. Mue-gai-nan   toiŋ gai   saŋ   puŋ zə

       every-Cl-person   read DE   three   CL   book

    'Everyone read three books'

           i. saŋ puŋ zə > Mue-gai-nan   √∃>∀

           ii. Mue-gai-nan > saŋ puŋ zə   √∀>∃

           √ distributive; √ collective

 [Turkish]

    c. Her   doktorun   üç   hasta-yı   muayene et-tiğ-i

       each   doctor-gen three   patient-ACC   examine do-DIK-Agr

    'Every doctor examined three patients'

           i.   üç hasta > her doktor   √∃>∀

           ii. her doktor > üç hasta   √∀>∃

           √ distributive; √ collective

[Jordanian Arabic]

    d. Kol   doctor   shaaf   thalath   maraDai

       every   doctor examine   three   patient.pl

    'Every doctor examine three patients'

           i. thalath maraDa > kol doctor   √∃>∀

           ii. kol doctor > thalath maraDa   √∀>∃

           √ distributive; √ collective

[Spanish]

    e. Cada doctor atendió a tres pacientes

           i. tres pacientes > cada doctor   √∃>∀

           ii. cada doctor > tres pacientes   √∀>∃

           √ distributive; √ collective

     If relativization of the direct object in (21a-e) is via movement as in the Head Raising Analysis, then the universal quantifier inside the TP is able to take scope over the quantifier variable within the head. This makes both the wide and narrow read-

ing possible. Nevertheless, if the head of the RC is originated in its surface position as in the Head External Analysis, then the position of the head is higher than the universal quantifier, and consequently, only the narrow reading is possible. Let's consider the following sentences:

(22)

[Cantonese]

    a. keoi gin-dou mui-go hok-saang tai-gwo ge loeng bun syu

       s/he   see   every   student   read GE   two CL   book

    'She saw the two books that every student red'

          i. saam go beng-jan > mui-g ji-sang   √∃>∀

          ii. mui-g ji-sang > saam go beng-jan   √∀>∃

          √ distributive; √ collective

[Chaoshan]

    b. Mue-gai-nan   toiŋ gai   saŋ   puŋ zə   baŋ dɔ hio.
       every-Cl-person   read DE   three   CL book put   at there

    'Three books that everyone read are put there.'

          i. saŋ puŋ zə > Mue-gai-nan   √∃>∀

          ii. Mue-gai-nan > saŋ puŋ zə   √∀>∃

          √ distributive; √ collective

 [Turkish]

    c. Her doktorun muayene   et-tiğ-i   üç   hasta-yı   gör-dü-m
       each doctor-gen bexamine do-DIK-Agr three patient-ACC see.pst.1s

    'I saw the three patients that every doctor examined'

          i. üç   hasta   > her   doktor   √∃>∀

          ii. her   doktor > üç   hasta   √∀>∃

          √ distributive; √ collective

[Jordanian Arabic]

    d. Hdir-na   thalath maraDai illi kol   doctor shaaf- iᵢ
       see.pst.1pl three   patient.pl that every doctor examin-them'

    'We saw the three patients that every doctor examine'

          i. thalath   maraDa > kol doctor   √∃>∀

          ii. kol doctor > thalath maraDa   *∀>∃

          * distributive; √ collective

[Spanish]

    e. Los tres pacientes a los cuales cada doctor atendió son de Perú

          i. tres pacientes > cada doctor   √∃>∀

          ii. cada doctor > tres pacientes   *∀>∃

          * distributive; √ collective

f. Los tres pacientes que cada doctor atendió son de Peru

    i. tres pacientes > cada doctor   √∃>∀

    ii. cada doctor > tres pacientes   √∀>∃

   √ distributive; √ collective

As the head nominal can be interpreted as having narrow scope (∃>∀) with respect to the quantifier within the relative clause in (22a-c), it can be concluded that in Cantonese, Chaoshan and Turkish uses the head raising strategy. However, the impossibility of having the narrow scope reading in Jordanian Arabic (22d) shows this language uses the head external analysis. In the case of Spanish, example (22f) allows a narrow scope interpretation, while (22e) does not. Hence, the head shows both behaviors in Spanish: in that- RCs the head raises to its surface position, while in Wh- RCs it is externally based-generated.

3.1.3. Partial Conclusion

Idioms and scope interaction have shown that in Cantonese, Chaoshan, Turkish and Spanish that- RCs the head is generated inside the relative clause and then raises to its surface position, while in Jordanian Arabic and Spanish Wh- RCs it is directly generated in its surface position. Since only in the Head Raising Analysis the head undergoes movement from within the CP, it must be concluded that RCs in Cantonese, Chaoshan, Turkish and Spanish that- show this analysis (23). On the contrary, RCs in Jordanian Arabic and Spanish Wh- there is no head movement, which indicates that they show the External Head Analysis. This last analysis presents two subanalyses depending on the behavior of the operator, as it is discussed in the following subsection.

(23)   [$_{DP}$ D [$_{CP}$ DP$_i$ [$_{C'}$ [$_{TP}$ . . . ~~DP~~$_i$ . . .]]]]

3.2. The operator

The operator is interpreted with the head outside the RC via a predication rule (Chomsky, 1977) or agreement relation (Browning, 1989). This operator can show two distinctive behaviors; it either raises to the Spec-CP position from its base-generated position (24a), or it is directly base-generated in the Spec-CP and co-indexed with a variable (24b).

(24)   a. [$_{DP}$ [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . ~~Op~~$_i$ . . .]]]]

      b. [$_{DP}$ [$_{NP}$ [$_{N'}$ N$_i$ . . .] [$_{CP}$ Op$_i$ [$_{TP}$ . . . e_i . . .]]]]

This subsection shows that relativization in Jordanian Arabic is derived by employing the Op-indexing analysis, which involves a base generated operator in the Spec position of the highest available CP (24b). It is assumed that the chain linking

the operator with its variable was not formed by movement in the LF, but established by Minimal Match Condition (Aoun and Li, 2003). Under the Minimal Match Condition, the operator forms a binding chain between the operator and the variable that this takes, which is a resumptive pronoun in Jordanian. Conversely, Spanish Wh-RCs displaces an overt Wh-operator, which, as it is demonstrated, links the chain with its variable though a syntactic movement (24a).

3.2.1. [+Q] embedded clause

CPs and DPs are phases and syntactic computations must be proceeded by phases (Chomsky, 2000, 2001). This restriction creates island effects in an [+Q] embedded clause. If the operator is originated inside the embedded [+Q] object clause, it must move directly across a CP phase since the specifier position of this phase is already filled, and therefore, the syntactic derivation crashes. However, if the operator is generated in the specifier position of the highest CP, the syntactic derivation does not crash. Now consider the following sentences in Jordanian Arabic (25a) and Spanish (25b).

(25)

[Jordanian Arabic]

a. Hdir-na $_{DP}$[z-zalamah $_{CP}$[Op$_i$ lli $_{TP}$[Jon b-itsaa?al $_{CP}$[leish

See.pst.1pl   the-man   that   Jon ask.3s   why

$_{TP}$[huwwe$_i$ katab   r-rissalah]]]]]

he   write.3s   D.letter

'We saw the man who Jon wonders why (he) wrote the letter'

[Spanish]

b. *Conozco $_{DP}$[al chico $_{CP}$[al cual$_i$ $_{TP}$[Jon se pregunta $_{CP}$[por qué $_{TP}$[el médico vio e_i]]]]]

The grammaticality of (25a) indicates that in Jordanian Arabic the operator did not previously hold another position, and therefore, that it was base-generated in the highest Spec-CP. Thus, the operator forms a representational binding chain with the resumptive pronoun *huwwe 'he'*. Conversely, The ungrammatically of (25b) indicates that in Spanish the operator underwent movement and crossed directly over a CP phase. Thus, in Spanish Wh- RCs the representational binding chain between the operator and the variable is established through movement of the former.

3.2.2. Adjunct clause

Extraction cannot occur out of an embedded adjunct clause. Hence, if there are any island effects in the following Jordanian Arabic and Spanish RCs (31a-b), it must

be concluded that there was a movement of the operator from within the adjunct. If there are not any island effects, on the other hand, it must be concluded that the operator was not base-generated inside the adjunct, but in its surface position, that is, in the highest Spec-CP position.

(26)

[Jordanian Arabic]

      a. Hdir-na ₒₚ[z-zalamehi cₚ[Opi illi   zi3il   Jon cₚ[la?inno
        See-pst.1p the-man   that got angry Jon because

      ₜₚ[sh-shurTa   maska-t-uhii]]]]
       the police   capture-pst-3s-him

   ‘We saw the man that Jon got angry because the police captured
      (him)’

[Spanish]

      b. *Conozco ₒₚ[al hombre cₚ[al cuali Juan se alegrará cₚ[si ₜₚ[el policía
        captura e_i]]]]

     The Jordanian Arabic example (26a) is grammatical, while the Spanish example (26b) is not. The grammaticality (26a) shows that in Jordanian Arabic RCs the operator did not undergo movement from within the adjunct but instead it was originated in the highest Spec-CP position from where it binds the variable *uhi*. On the contrary, the ungrammaticality of (26b) indicates that in Spanish RCs the operator raised to its surface position from within the adjunct.

3.2.3. Partial Conclusion

     Spanish Wh- RCs show island effects indicating that the operator undergoes movement to Spec-CP forming a chain that links the operator with the variable. In Jordanian Arabic RCs, on the other hand, the lack of island effects shows that the operator is base-generated in the Spec-CP position from which it binds a variable in the gap position. (27a) and (27b) show the syntactic representation of Spanish Wh- and Jordanian Arabic RCs respectively:

(27)   a. [ₒₚ[ₙₚ[ₙ′ Ni . . .] [cₚ Opi [ₜₚ . . . ~~Op~~i . . .]]]]
       b. [ₒₚ[ₙₚ[ₙ′ Ni . . .] [cₚ Opi [ₜₚ . . . e_i . . .]]]]

4. Conclusion

     By analyzing the syntactic properties of RCs in Cantonese, Chaoshan, Turkish, Jordanian Arabic and Spanish, this study has confirmed that UG offers two different strategies to construct RCs: the head raising strategy (28a) and the head external strategy with operator movement (28b) or *in situ* (28c). Cantonese, Chaoshan and

Turkish use (28a) while Jordanian Arabic uses (28c). This study has also confirmed that UG can offer both strategies to the same language. Spanish uses (28a) with that-RCs, while it uses (28b) with Wh- RCs.

(28)   a. [DP D [CP DP$_i$ [C′ [TP . . . ~~DP$_i$~~ . . .]]]]

b. [DP [NP [N′ N$_i$ . . .] [CP Op$_i$ [TP . . . ~~Op$_i$~~ . . .]]]]

c. [DP [NP [N′ N$_i$ . . .] [CP Op$_i$ [TP . . . e_i . . .]]]]

The Head Raising Analysis predicts that Cantonese, Chaoshan and Turkish RCs are going to be postnominal, yet they are prenominal as it can be observed in examples (29a-c). Thus, some other syntactic derivations are required in order to capture the grammatical word order. These syntactic derivations, however, are left for further research.

(29)

[Gwongdongwa]

a. ngo tai-gin [tung ngo sik   fan   *go2   go3 leoi-jan*]

1sg   see   with   1sg. eat   rice   ᴅ.that CL woman

'I saw the woman that ate rice with me.'

[Swatawe]

b. [bi   zi-bau   gai *no-gia*] lai-dzio.

carry book-bag DE   child   come-past

'The child who was carrying a book-bag came here.

[Turkish]

c. Ben [anne-m-in   pişir-diğ-i   *yemeğ-i*] ye-di-m.

I mother-poss1-gen1 cook-DIK-poss3 food-ACC eat-past-1s

'I ate the food that my mom cooked'

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