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The Third Reading of the Most Expensive Photo of Abby

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1 Introduction

Superlative expressions in (1) has been observed to involve multiple interpretations cross-linguistically: 1) the absolute reading (ABS) in (1a), 2) the relative reading with NP external focus (REX) in (1b), and the relative reading with NP internal focus (RIN) in (1c).

This paper will focus on the recently discovered interpretation RIN in (1c). The availability of the interpretations varies across languages (see Pancheva and Tomaszewicz 2012), for example, the interpretation in (1c) is not available in the English sentence in (1) while it is available in the similar sentences in Polish in (2).

- (1) John bought the most expensive photo of Abby.
a. The photo of Abby John bought is more expensive than any other photo of Abby. (ABS)
b. The photo of Abby John bought is more expensive than any other photo of Abby that anyone else bought. (REX)
c. The photo of Abby John bought is more expensive than any other photo that John bought. (RIN)
- (2) Iwan poznał naj-młodszych studentów z wydziału lingwistyki (Polish)
Ivan met est-young students from department linguistics.gen
Lit.: Ivan met the youngest students from the Linguistics department.
RIN: 'The students from the Linguistics department that Ivan met are younger than students from other departments that he met'

Previous researches on the RIN (Pancheva and Tomaszewicz 2012, Shen 2014) focus on the cross-linguistic aspect of its distribution but a small amount of constructions. This paper will investigate the availability of the RIN in more constructions in English and German. A new generalization of its distribution will be proposed which will be deduced with the standard locality constraints.

2 Previous Research

2.1 ABS and REX

I follow the standard semantics of the superlative morpheme *-est* as in (3). The *-est* morpheme first takes a contextually determined comparison class of type $\langle e, t \rangle$, then a degree predicate of type $\langle d(e, t) \rangle$, and finally an individual argument of type e . There are two presuppositions for *-est* to be defined: (i) the individual argument of *-est* must be a member of the comparison class (ii) all the members of the comparison class must be arguments of the degree predicate.

- (3) $\llbracket -est \rrbracket = \lambda C_{\langle e, t \rangle} . \lambda D_{\langle d(e, t) \rangle} . \lambda x_e . \exists d [D(d)(x) \& \forall y [y \in C \& y \neq x \rightarrow \neg D(d)(y)]]$
 $-est(C)(D)(x)$ is defined iff (i) $x \in C$ and (ii) $\forall y [y \in C \& \exists d [D(d)(y)]]$

Two approaches have been proposed for the ABS and the REX. Szabolcsi (1986) and Heim (1999) both propose a scope account for the REX where the focus (*John* in (1)) moves to a higher position and the Degree phrase (DegP) moves and tucks in under as shown in (4). When everything is interpreted in situ, the ABS is attested as in (5).

- (4) $[_{TP} \text{John}_1 [_{TP} [_{DegP} \text{est } C] [_{TP} \sim S [_{TP} t_1 \text{ bought the } t_{DegP} \text{ expensive photo of Abby }]]]]$
(5) $[_{TP} \text{John bought } [_{DP} \text{the } [_{NP} [_{AP} [_{DegP} \text{est } C] \text{expensive }] [_{NP} \text{photo of Abby}]]]]$

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One last requirement for the LF of RIN is that the movement of the focus needs to precede that of the DegP. Only when the movements proceed in this order could we have the configuration between the landing sites and the indice as in (8). The configuration in (12a) is not obtainable and (12a) can be obtained but different orders of movements but its calculation will crash.

- (12) a. [Focus₁ [DegP₂ [1 [2 [~S [John has t_{DegP} good albums of t_F]]]]]]
 b. [Focus₁ [1 [DegP₂ [2 [~S [John has t_{DegP} good albums of t_F]]]]]]

Having motivated these requirements on the LF of the RIN, I will show how their interaction with the locality constraints accounts for the distribution of the RIN in Section 4. The following section will layout the distributions of the RIN in English.

3 Generalization

In Scenario I in (13) the most expensive purchase by John is a photo of Abby, however it is not the most expensive photo of Abby.

- (13) Scenario I: John, Bill, Mary are photo collectors. Abby, Ben, Cara are models. Each collector bought a photo of each model and the prices of the photo are as listed below.

Collector	Model: Price	Collector	Model: Price	Collector	Model: Price
John	Abby: \$800	Bill	Ben:\$600	Mary	Abby: \$900
	Ben: \$700		Abby: \$500		Cara: \$300
	Cara: \$200		Cara:\$200		Ben: \$200

Sentences in (14) can only be judged true under the RIN in this scenario. As is shown, the RIN is not attested. The # indicates that the sentence is false under the scenario.

- (14) Canonical
 a. # John bought the most expensive photo of Abby.
 b. # John hat das teuerste Photo von Abby gekauft. (German)
 John has the most.expensive photo of Abby bought.

Polar questions in (15) cannot get the positive answer.

- (15) Polar question
 a. - Did John buy the most expensive photo of Abby?
 b. -Yes.
 c. # -No.

As for the *wh*-question in (16a), the availability of the fragment answer in (16b) indicates that the *wh*-question allow the RIN. Note that the full answer in (16c) is still not true here.

- (16) *Wh*-movement and its fragment answer
 a. - Who did John buy the most expensive photo of?
 b. - Abby.
 c. # - John bought the most expensive photo of Abby.
- (17) *Wh*-movement and its fragment answer in German
 a. Von wem hat John das teuerste Photo gekauft?
 Of who has John the most.expensive photo bought?
 b. - Abby

It-clefts (18), Pseudo-clefts (19), and relative clause (20) that involve the movement of the focus *Abby* all allow the RIN.

- (18) *It*-cleft

- a. It was Abby that John bought the most expensive photo of.
- b. Es war Abby, von dem John das teuerste Photo gekauft hat.
It was Abby of who.dat John the most.expensive photo bought has.

(19) Pseudocleft
Who John bought the most expensive photo of was Abby.

- (20) Relative Clause
- a. Abby was the model of whom John bought the most expensive photo.
 - b. Abby ist das Modell von der John das teuerste Photo gekauft hat.
Abby is the model of who.dat John the most.expensive photo bought has.

The same constructions with movement of elements other than the focus do not allow the RIN.

- (21)
- a. # It was John who bought the most expensive photo of Abby.
 - b. # Who bought the most expensive photo of Abby was John.

The unacceptable answer to the alternative questions indicates that the alternative questions, which have been argued to involve covert movement of the disjunction (Nicolae 2013), do not allow the RIN.

- (22) Alternative Question
- a. -Did John buy the most expensive photo of Abby or Cara?
 - b. # - Abby.

In Scenario II in (23), the most expensive purchase by John is a photo of Abby, the most expensive purchase by Bill is a photo of Ben, and the most expensive purchase by Mary is a photo of Cara. In both sentences in (24) the universal quantifier is forced to QR over the existential quantifier. However the RIN is not available in (24a).

(23) Scenario II

Collector	Model: Price	Collector	Model: Price	Collector	Model: Price
John	Abby: \$800	Bill	Ben: \$800	Mary	Cara: \$70
	Ben: \$700		Abby: \$500		Abby: \$50
	Cara: \$100		Cara: \$80		Ben: \$20

- (24) Quantifier Raising
- a. # A different collector bought the most expensive photo of every model. ($\forall > \exists$)
 - b. A different collector bought a photo of every model. ($\forall > \exists$)

In Scenario III in (25), the oldest student enrolled by School A is from the same family as the oldest student enrolled by School B. (26b) shows that QR is possible. The sentence in (26a), however, cannot truth described this scenario, indicating the absence of the RIN.

- (25) Scenario III: Among the three children School A enrolled this year, Ross Gellar is the oldest. Among the three children School B enrolled this year, Monica Gellar is the oldest. Ross Gellar and Monica Gellar are siblings. They have an older sister so neither is the oldest child of their family.

	Name - Age		Name - Age
School A	Ross Gellar - 17	School B	Monica Gellar - 15
	Phoebe Buffay - 16		Chandler Bing - 14
	Joey Tribbiani - 13		Rachel Green - 13

- (26) ACD
- a. # School A enrolled the oldest child of the same family as School B did.
RIN: The oldest children that two schools enrolled are from the same family.
 - b. School A enrolled a child of the same family as School B did.

Having going over the data above, it is shown that the canonical sentences, polar questions, alternative questions, sentences involving QR and ACD do not allow the RIN while the *it*-cleft, pseudo-cleft, *wh*-question, fragment answer, and relative clauses that involve the movement of the focus allow the RIN. Thus I propose a generalization regarding the availability of the RIN in English and German in (27). I will classify the German and English under the label "English type languages".

- (27) Generalization regarding RIN in English-type languages: RIN is only possible when the NP internal focus is overtly moved to a position c-commanding the degree phrase (DegP).¹

4 Accounts

4.1 Previous Proposals

Pancheva and Tomaszewicz (2012) propose a Degree island account for the distribution of the RIN based on the data in (1) and (2) repeated here in (28) where the English sentences do not allow the RIN while the Polish sentences do. They claim that the overt definite article in English superlative expressions blocks the movement of the DegP, thus the LF for the RIN cannot be obtained. The Polish sentence on the other hand does not have the overt definite article, thus the RIN is attested. However this island effect doesn't affect extraction of other elements from this same phrase as shown in (29), which is left to be explained. See (Shen 2014) for more arguments against this approach.

- (28) a. John bought the most expensive photo of Abby.
 b. Iwan poznał naj-młodszych studentów z wydziału lingwistyki (Polish)
 Ivan met est-young students from department linguistics.gen
 Lit.: Ivan met the youngest students from the Linguistics department.
 RIN 'The students from the Linguistics department that Ivan met are younger than students from other departments that he met'

- (29) Who did John buy the most expensive photo of?

Shen (2014) proposed another syntax-based account, also linking the distribution of the RIN to the definite determiner. Shen (2014) follows Bošković (2005), a.o. in assuming that languages including Polish lack the determiner projection and thus the highest projection within the nominal domain is NP (a.k.a. NP languages), whereas DP exists in English, German, Spanish (a.k.a. DP languages). Following the dynamic approach of phases where the phase is the highest projection in a domain, DP is a phase in DP languages and NP is a phase in NP languages. Shen further assumes locality constraints like Phase Impenetrability Condition (PIC): movements out of a phase is required to go through the edge of the phase in a successive cyclic fashion; and Anti-locality: any movement needs to cross at least one full phrase (Bošković 2005).

Since English is a DP language and DP is a phase in English, the movements out of DPs need to go through the edge of DP, i.e. the Spec,DP position. Since for the RIN both the focus and the DegP need to move out of the DP, there will be a clash of elements to move to Spec,DP. As a result, the movements required by the RIN cannot both happen. The RIN is thus disallowed.

For NP languages like Polish on the other hand, the NP is the highest projection thus the phase. Since the PP adjunct and the DegP are both generated at the edge position of the NP, the movements are allowed and so is the RIN in such languages.

This approach accounts for the data with the independently motivated locality constraints without proposing an island just for DegP. However, such approaches cannot explain the English sentence that do allow the RIN in the previous section. For example, the RIN has been shown to be available in *wh*-questions in English in (30). The LF in (31) shows that moving two elements out of the DP must be possible for the RIN to be possible. The approach in (Shen 2014) makes the opposite prediction.

¹The cases of null operator movements are left open here, e.g. tough movement, comparatives, and structures involving *enough*, *too*. Some cases of overt movement that have been left open here include HNPS, extraposition, and gapping.

- (30) Who did John buy the most expensive photo of?
 (31) [_{CP} Who₁ [_{CP} [_{DegP} est C] did [_{TP} John buy [t₁ t_{DegP} the [_{NP} [_{AP} t_{DegP} expensive] [_{NP} photo of t₁]]]]]]?

4.2 Current Proposal

This section will layout an alternative account for the distribution of the RIN largely in the spirit of that in (Shen 2014). I will follow the assumptions in (32). I refer the readers to the references for details and arguments for these components.

- (32) a. Dynamic Approach to Phases: The highest projection within a domain functions as a phase. (Bošković 2014; Bobaljik and Wurmbrand 2005; Wurmbrand 2013).
 b. Languages including Polish, Slovenian, Serbo-Croatian lack definite articles thus NP is the highest projection within the nominal domain, while Languages including English, German, Spanish, and Dutch have articles and DP. (Bošković 2005; Despić 2013)
 c. Movement out of a phase need to go through the edge of the phase, i.e. the Specifier and the adjoined positions. (Chomsky 2000)
 d. Movement must cross one full phrase. (Bošković 2005)

4.2.1 Part 1: Adjunct

The generalization in (27) involves three parts: sentences with focus on the NP adjunct, sentences with covert movement of the argument to N, sentences with overt movement of the argument to N. This subsection deals with the first part as shown in (33). The RIN interpretation is not available in (33).

- (33) # John bought the most expensive photo in the box.
 RIN: The photo in the box that John bought is more expensive than the photos elsewhere that John bought.
 (34) # [_{TP}[_{PP}in the box][_{TP}[_{DegP}est C] [_{TP}1.d [_{TP} S [_{TP}2.e [_{TP} John bought the t_{DegP} expensive photo t_{PP}]]]]]]]

The unavailability of the RIN indicates the unavailability of the LF for the RIN in (34), which involves the movement of the focus *in the box* out of the DP. Note that the focus here is the NP adjunct and it has been noted that in English, such adjuncts cannot move out of DP, as evidenced by the examples in (35). (35a) and (35b) show that the overt movement of the adjunct is not possible. (35c) shows that QR is ruled out as well. Since such movement of the NP adjunct is impossible, the unavailability of RIN that requires this movement is accounted for.

- (35) a. * It was in the box that John bought a photo.
 b. * Where did John buy a photo?
 c. * A girl bought a painting in every box. (*every box >> a girl)

The immobility of the NP adjunct in the English type languages can be accounted for by the locality constraints (Bošković forthcoming, 2014). Given PIC, the movement of the NP adjunct out of the DP phase need to go through the edge of the phase, i.e. the Spec,DP or the DP adjoined positions. However, such movements from NP adjoined positions to DP adjoined positions do not cross a full phrase, thus they are too short and ruled out by Anti-locality.²

²Movement of the DP within the adjunct is allowed in English (P-stranding):

- (i) Which department did John met students from?

If this P-stranding is allowed in LF, it is not clear how the RIN can be blocked. I will leave this issue open here and assume that P-stranding of this kind is not allowed in LF. See (Stepanov 2012) for a recent account arguing for a mechanism for P-stranding that can be accounted in the current system.

4.2.2 Part 2: Argument+Covert movement

The second part of the generalization involves sentences with the argument of the noun as focus and the covert movement of the focus in canonical sentences, polar questions, alternative questions, and sentences involving QR and ACD. I will take the canonical sentence in (36) as an example.

- (36) Canonical
- a. # John bought the most expensive photo of Abby.
 - b. # John hat das teuerste Photo von Abby gekauft. (German)
John has the most.expensive photo of Abby bought.

Note that these sentences with arguments of nouns as focus cannot get the same explanation as the sentences with adjuncts as focus. The movement of the argument out of a DP is allowed in DP languages in (37).

- (37) a. Who did John buy a photo of?
b. It was Abby that John bought a photo of.
c. A collector bought a photo of every model. (*Every model* >> *a collector*)

Note also that the LF for the RIN involves movements of both the focus and the DegP. Richards (2001) has shown that the movements of multiple elements preserve the hierarchical relation of their based-generated positions in multiple *wh*-movement, scrambling, object shift of multiple objects, and clitic clustering. He argues that after the movement of the element that is generated higher, the lower element moves and tucks in beneath the first landing site, creating a cross path. To account for such constraint Richards proposed the economy principle in (38). Chomsky (1993) used similar economy principle to account for the superiority effects and Bruening (2001) the scope freezing effects.

- (38) Shortest: A pair P of elements [a,b] obeys Shortest iff there is no well-formed pair P' which can be created by substituting r for either a or b, and the set of nodes c-commanded by one element of P' and dominating the other is smaller than the set of nodes c-commanded by one element of P and dominating the other.

The Shortest principle constraints movement of multiple elements to the same position. The movement that involves the shortest path occurs first and the movement that involves a longer path follows and lands in a lower position. Given the PIC, both DegP and the focus/complement *Abby* need to move via the edges of DP. Given that the DegP is part of an adjunct to NP and the focus is the complement to N, the path from DegP to the Spec,DP is shorter than the one from *Abby* to Spec,DP in terms of intervening nodes. As a result the DegP moves first to the edge in (39b) and the focus tucks in under the DegP at the edge of the DP in (39c).

- (39) a. [_{TP1} John [_{VP} has [_{DP} the [_{DegP} EST-C] expensive photo of Abby_F]]]
b. [_{TP1} John [_{VP} has [_{DP} [_{DegP} EST-C] [_{DP} the t_{DegP} expensive photo of Abby_F]]]]
c. [_{TP1} John [_{VP} has [_{DP} [_{DegP} EST-C] [_{DP} Abby [_{DP} the t_{DegP} expensive photo of t_F]]]]]]

Now at the highest edge of the DP phase, the DegP moves first to the sentential domain and the focus then tucks in under the DegP in the similar manner, resulting in the LF in (40a).

Remember that in Section 2.2 four requirements of the LF for the RIN in (40b) are argued for: i) the movements of DegP, ii) the movement of the focus, iii) the focus takes scope over DegP, and iv) the movement of the focus precedes that of the DegP. (40a) cannot meet neither iii) nor iv) in that the movement of DegP precedes that of the focus and the DegP takes scope over the focus. As a result, (40a) cannot be calculated and the RIN is not available. In short, the Shortest principle constraints the order of the movements of the focus and the DegP while the LF requires the other order. The clash of such restrictions causes the absence of the RIN.

- (40) a. [[_{DegP} EST-C][Abby_F [[1.d [~S [_{TP2} 2,e [_{TP1} John [_{VP} has [_{DP} the t_{1,d} expensive photo [t_{2,e}]_F]]]]]]]]]]

- b. [Abby_F [[_{DegP} EST-C][[1.d [°S [TP₂ 2,e [TP₁ John[_{VP} has [_{DP} the t_{1,d} expensive photo [t_{2,e}]_F]]]]]]]]

The unavailability of RIN in other constructions involving covert movements, e.g. polar questions, alternative questions, and sentences with QR and ACD, can be accounted for in the same way as illustrated above³.

4.2.3 Part 3: Argument+Overt Movement

The third part of the generalization involves sentences with the argument of the noun as focus and the overt movement of the focus in *wh*-question and the fragment answer, *it*-cleft, pseudo-cleft, and relative clause. Here I will use *wh*-questions and the fragment answers in (41) as a showcase. The fragment answer in (41b) to the question in (41a) indicates that the *wh*-question allow the RIN.⁴

- (41) Wh-movement and its fragment answer
 a. - Who did John buy the most expensive photo of?
 b. - Abby.

The questions in (41a) allowing the RIN suggests that the proper LF for RIN can be obtained. The previous subsection demonstrates that sentences involving a covertly moved argument cannot obtain the RIN because of the Shortest principle. It will be deduced that the effects of the Shortest principle disappear when the two relevant movements differ in overtness, more specifically, when the movement of the focus is overt and the movement of the DegP is covert.

In a traditional Y model, overt movements occur in the DS-SS and the covert movements occur in the LF. Since the DS-SS precedes the LF in the derivation, all overt movements precedes covert movements. Assuming that the Shortest principle is a local economy principle which holds for movements within LF or Syntax, it does not affect movements on different levels. The Shortest principle can rule out some derivations in the cases of the covert movement of the focus because the other movement: that of the DegP is also covert. But in the case of the overt movement of the focus, the Shortest principle is not relevant since the movement of the focus and the movement of the DegP can not competing across levels. With the Shortest principle out of the picture, the configuration required by the LF becomes available and it is predicted that sentences with overtly moved focus allow the RIN.

Certain single cycle multiple spell-out frameworks that eliminate the traditional LF can account for this part of the generalization in the similar way. Take the Single Cycle model in (Nissenbaum 2000) for example. Nissenbaum (2000) proposes that the spell-out occurs in each cycle/domain of derivation with both the traditional overt and the traditional covert movements applying at the same cycle but with the former preceding the latter. In this proposal, overt movements in cycle X take place before transfer to PF, and covert movements on cycle X occurs after transfer to PF. They both apply before any movement on a higher cycle Y. Under this model the overt movement also occurs before covert movement, thus lifting the effects of Shortest and allowing the RIN in the cases of overt movement of the focus. In (42a), the focus element *who* overtly moves to Spec, DP. The structure is sent to transfer. Then the DegP tucks in under the landing site of *who* (42c). In the following cycles, the two movements proceed in the same manner and the result structure is the correct LF for RIN in (42d).

- (42) a. Overt movement [_{DP} who D [_{NP} [_{AP} [_{DegP} EST C] expensive] picture t_{who}]]]]
 b. Transfer

³Note that the reasoning ruling out the RIN here does not have an effect on the Polish sentences with the NP adjunct as focus that allow the RIN discussed before. Since the focus PP adjunct is generated higher than the DegP, the movement of the focus precedes that of the DegP.

⁴Given that ellipsis can rescue locality violations (Lasnik 2001, Bošković 2011, among others), any locality violation here would be repaired under ellipsis anyway, even if the focus and DegP move on the same level.

- c. Covert movement [_{DP} who DegP D [_{NP} [_{AP} t_{DegP} expensive] picture t_{who}]]]]]
- d. [_{CP} who DegP C [_{TP} John T [_{VP} bought [_{DP} t_{who} tDegP D [_{NP} [_{AP} t_{DegP} expensive] picture t_{who}]]]]]]]?]

As for the fragment answer in that allows RIN, Merchant (2001) among others argues that fragment answer is a variant of sluicing, which involves the overt movement of the fragment to the CP level followed by the PF deletion of the rest of the sentence. *Abby* undergoes focus movement to Spec,CP before CP gets elided. Since the movement of the fragment answer is overt in this approach, the availability of RIN here can be accounted for in the same way as the *wh*-question.

Besides *wh*-questions and fragment answers, constructions like *it*-cleft, pseudo-cleft, and relative clauses, all of which have been argued to involve the overt movement of the focus element, license RIN. Kiss (1998) argues that the cleft constituent is moved to Spec,FP under the copula. The *wh*-clause in pseudo-cleft has been argued to be a free relative where the *wh*-element undergoes *wh*-movement (Bošković 1997). In the relative clause construction, *Abby* (head of of relative clause) has been argued to undergo overt movement from its base-generated position to the Spec,CP position of a CP which is the complement to D (Kayne 1994 a.o.). The presence of the RIN in these constructions can be accounted for in the same way as the *wh*-question.

4.2.4 Focus Cannot Be Topic

Sentence (43) involves the overt topicalization of the complement of N. However the RIN is not allowed unlike cases discussed above. Thus (43) is a potential violation of the generalization.

- (43) # Von Abby hat John das teuerste Photo gekauft.
 Of Abby has John the most.expensive photo bought.
 As of Abby, John bought the most expensive photo of her.

The lack of the RIN in (43) is accounted for if we assume that the focus association is necessary for the RIN (Tomaszewicz 2013). Note that despite the disambiguating effect of focus, focus association is considered neither necessary nor sufficient for the absolute reading or the relative reading with NP external focus (Heim 1999). However for the relative reading with NP internal focus, the focus association is necessary but not sufficient under the proposed account here and in (Pancheva and Tomaszewicz 2012). Recall that in the semantics of RIN, the focus association is one of the two requirements on the value of the comparison class C. The absence of the RIN in a sentence with the DegP interpreted in situ would be left unaccounted for if the focus association were optional. Thus, to account for (43), I follow the standard assumption that topicalization involves an element moving to a topic position and that an element cannot be both topic and focus at the same time (for details on topic, see Reinhart 2006). In (43), even though the complement to N overtly moved to a higher position and the DegP in principle could QR under its landing site, the lack of focus association rules the RIN out.

This paper presents a novel generalization regarding the distribution of the RIN and an account where it is the semantics requirement and the syntactic constraints that interplay to account for this *superlative conspiracy*.

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