# Information Structure and Interfaces

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Information structure has been extensively investigated throughout the history of linguistics. From different perspectives and using different terminology, it is generally assumed that information structure includes the notions of topic and focus. The description of information structure in generative grammar can be traced back to Chomsky (1972) and Jackendoff (1972). Within the generative framework, there has been a continuous debate about the impact of these discourse-linked functions upon syntax. A purely syntactic approach to information structure is unconceivable due to the fact that topic and focus have specific semantic and prosodic properties, though subject to cross-linguistic variation.

In this special issue we have brought together researchers who work on information structure from different perspectives. Interestingly, the most prominent common characteristic is that they analyse interface factors (semantic and phonological) which influence the way syntax manipulates the topic-focus partition.

The paper by María Luisa Zubizarreta deals with the syntax-phonology interface. Specifically, she pays attention to the connection between the syntactic structure of the sentence and the phonological rules which are in charge of assigning focus in languages. She analyses data from typologically different languages, namely Bantu languages such as Kimatuumbi, Chimwiini and Chichewa, and Italian to claim that in both types of language there is a focus position above *v*P *à la* Belletti 2004, which in many respects is similar to the focus slot detected in the higher field of the sentence. The syntactic structure for focus constructions may be characterised as follows, based on Belletti's (2004) and Aboh's (2007) proposals:

(i) [ Spec [ **Foc** [ Spec [ T [ Spec [ **Foc** [ vP [ VP … ]]]]]]]]

The author puts forward the hypothesis that syntax and prosody are connected in such an intricate way that the low focus position in the sentence is responsible for p(rosodic) boundaries. More accurately, the element placed in the specifier of the FocP above vP triggers the insertion of a strong p-boundary, due to the functional (vs. lexical) character of the Foc projection. This has crucial consequences for the constituents to the right of the p-boundary after focus since, in Zubizarreta's terms, a 'ripple' effect accounts for the flanking of these right-hand elements with p-boundaries. The 'ripple' phenomenon is also shared by Bantu languages and Italian. To illustrate, consider the answer in (ii) in Chimwiini, taken from Kisseberth (2010):

(ii) Q: [bigilile *ka <u>ní</u>*/ mu-sm<u>áa</u>ri/ l-kut<u>áa</u>=ni]
   'you hammered *with what*/the nail/into the wall?'

   A: [m-bigilile *ka n-duun<u>dó</u>*/ mu-sm<u>áa</u>ri/ l-kut<u>áa</u>=ni]
   'I hammered with a hammer/ the nail/ into the wall'

In this sentence the verb has moved to T and the constituent *ka n-duundó* 'with a hammer' has been marked as focus, which means that it has undergone movement to Spec-FocP. This triggers the insertion of a strong p-boundary after the focused element. As a consequence, the constituents to the right of Foc are also flanked by strong p-boundaries in compliance with the 'ripple' effect that Zubizarreta proposes.

The author further discusses data from Italian and, following Cardinalletti (2002), makes a distinction between emarginated and right-dislocated elements. The latter involve some kind of movement, whereas the former are *in situ*. Emarginated constituents follow focus. Similar to Bantu languages, for Italian Zubizarreta claims that the same prosodic and syntactic account may hold for sentences such as (iii):

(iii) (M**à**ngera    PASTA,) (Cárla).
   eat-FUT.3SG pasta    Carla
   'Carla will eat pasta.'

In this example the subject *Carla* is emarginated, i.e. it stays *in situ*. The object *pasta* is located in Spec-FocP, which triggers the insertion of a strong p-boundary after Foc. This is supported by the shift of stress in the verb (*Rhythm Rule*, Frascarelli 2000). The 'ripple' effect accounts for the flanking of the emarginated subject between strong p-boundaries.

It is interesting that although much work need be done to understand the interconnection of the prosody and the syntax of focus, the conclusions that Zubizarreta arrives at are perfectly extended to other languages. She even makes a short trip to the prosodic phrasing in Spanish. The sentence-internal focus position in Spanish is described as contrastive, similar to Italian. However, in contrast with Italian, Spanish does not employ any phonological boundaries after focus.

As regards the field of study, as we have made clear earlier, Zubizarreta analyses the syntax and prosody of focus within the sentence and assumes that the low focus position is available for information focus (purely new information), whereas the high focus position is used for contrastive focus (new information which corrects or make a contrast with a previous assertion) (see Kiss 1998). However, the sentence is not the only linguistic unit whose information structure has been addressed in current research. The primary goal of Aslı Göksel's paper is to show that alongside the sentence, complex words are also susceptible to discourse interpretations. She concentrates on Turkish morphologically complex words. In this language the position of stress can be changed for interpretive reasons. However, Göksel discusses an issue which has hardly been raised before, namely the information structure and prosody of these complex words.

Sebüktekin (1984) has acknowledged the presence of contrastive focus in this type of complex words. However, Göksel presents new data to the effect that the stress modification corresponds to the distinction between informational focus (iva) and contrastive focus (ivb) at the word level:

(iv) a. git-miş-l**é**r-Ø-di
   go-PERF-3PL-copula-PAST
   'They'd gone.'

   b. git-m**í**ş-ler-Ø-di
   go-PERF-3PL-copula-PAST
   'They HAD gone.'

These examples are taken to indicate that the word-internal contrastive focus position is immediately preceding the copulative element. The different morphemes that make up a complex word may be selected to be stressed as

contrastive focus due to the fact that they are assumed to be generated as syntactic nodes.

This analysis throws light on the way morphology and syntax interact with each other. In contrast with proposals which assume a unique source for morphosyntactic operations (Halle & Marantz 1993), Göksel shows that the form and the interpretation of a construction is simultaneously determined by different components of grammar, in line with Ackema & Neeleman (2005), DiSciullo (2005), *etc*. In other words, the formation and interpretation of a construction depends on interface conditions, something which is independently motivated in current studies within generative grammar (Grohmann in press, Jiménez 2009).

A different view is taken by Enoch Aboh, who claims in his paper that the only interface which relates to information structure is the Lexicon. One of the main questions that Aboh is concerned with is how information structure is handled by the computational system. It is commonly assumed in the relevant literature that information structure-related issues should not be part of the numeration, the lexical array containing all items necessary for the formation of sentences (Chomsky 1995). More precisely, information structure notions such as topic or focus cannot be included in the numeration in the form of grammatical features. The reason usually advocated is that this would violate the Inclusiveness Condition, which precludes any addition in the course of a derivation. In clear contrast with this viewpoint, Aboh claims that discourse determines the numeration of a linguistic expression. If this is on the right track, syntax should include opertaions motivated by information structure. In this connection, Aboh further holds that topic, focus and interrogative are grammatical features, similar to Case features or φ-features, which are responsible for the derivation of a construction. He adopts Rizzi's (1997 and subsequent) framework according to which syntactic derivations may include TopP, FocP and ForceP (or IntP), and shows that the intervening role of the numeration between information structure and syntax may be clearly seen at the CP and DP levels.

To start with, the Inclusiveness Condition requires that focus fronting constructions such as (v) be handled at the interfaces, PF and/or LF (Zubizarreta 1998):

(v) Beans I really detest.

However, wh-movement is widely accepted to involve an [Interrogative]-feature which is responsible for moving the operator to the left periphery. This analysis is supported by languages where the Inter head is realised by an explicit morpheme, as Aboh argues. Such is the case of Lele. Moreover, Aboh provides examples in Gungbe where Foc and Top are morphologically realised:

(vi) Ùn  sè  ɖɔ̀  dàn  lɔ́  yà  Kòfí  hù  ì

    1SG hear  that  snake  DET  TOP  Kofi  kill  3SG

    'I heard that, as for the snake, Kofi killed it.'

(vii) Ùn  sè  ɖɔ̀  dàn  lɔ́  wὲ  Kòfí  hù

    1SG  hear  that  snake  DET  FOC  Kofi  kill

    'I heard that Kofi killed THE SNAKE.'

Gungbe is an SVO language and in both sentences the object *dàn lɔ́* 'the snake' has been displaced to the left of the particles *yà* and *wὲ* in (vi) and (vii) respectively. This complies with the minimalist definition of movement in that the displacement of the relevant categories is morphology-driven (Chomsky 1995), which in turn implies that the motivation for such a movement is crucially related with the numeration. The fact that we find these discourse-linked particles in many languages suggests that when acquiring their language native speakers must learn these elements as part of their Lexicon. In other words, they must be present at the beginning of the derivation thereby satisfying the Inclusiveness Condition. This view is also shared for many languages, such as Japanese and Korean, see Miyagawa (2010).

In line with Chomsky (1977), Aboh claims that just like question markers project in the syntax, so do topic and focus markers. For Uniformity in the Germanic/Romance paradigm it should also be the case that topic and focus are features which activate syntactic mechanisms. To illustrate, in Spanish there are lexical devices which are linked to the notion of focus. For instance, adverbs such as *sólo* 'only' are used for focusing:

(viii) Sólo zumo de naranja tomaré  hoy.

    only juice  of  orange  have-FUT.1SG today

    'I will have only orange juice today.'

Additional support comes from polarity-related items such as *sí* (*que*), whose function is similar to English emphatic do (Hernanz 2006):

(ix) Zumo de naranja sí    tomaré hoy.
     juice  of  orange  yes have-FUT.1SG today

     'orange juice, yes, I will have some today.'

This is evidence in favour of projecting a Foc head in syntax, which strongly favours the presence of such a head in the Lexicon.

In clear parallelism with CP, Gungbe has discourse particles which make explicit the information structure of DPs. Specificity markers make sure that no mismatch arises when preposing focus or topic to the left periphery. Focalisation may occur with either bare DPs or full DPs, whereas topicalisation is only compatible with definite and/or specific constituents. This explains why topic fronting involves a special specificity marking in DPs, which is compatible with the topic marker *yà* (See also Göksel, this volume, for focus marking in DPs).

To finish his argumentation, Aboh establishes a parallelism among ϕ-features, Case features, tense features and discourse features (topic and focus). Concentrating on tense features, Aboh argues that Gungbe has one tense marker only and this must occur to the right of the subject, assuming that this moves to Spec-TP. This is taken as evidence that the tense feature is present in the Lexicon. A similar reasoning leads Aboh to conclude that topic and focus features are part of the Lexicon since the topicalised and focalized constituents must occur to the left of the relevant particle.

A different perspective on information structure is the one put forth by Satoshi Tomioka. In his paper he discusses the nature of contrastive topics. He makes a distinction between contrastive topics and thematic topics and suggests that, from a semantic point of view, contrastive topics share much more in common with focus than with topics. The interpretation of contrastive topics crucially depends on a competition with focus. He also distinguishes two focal strategies, based on Wold's (1996) idea of selective binding and double indexing of focus.

Contrastive topics are explicitly marked in Japanese by the morpheme -*wa*, and they receive a focal stress which establishes focal alternatives among speech acts. For the sake of illustration, consider example (x) discussed by Tomioka:

(x) Trying to give advice on where to visit in Japan, one might say;

    *KYOOto-ni-wa/KYOOto-ni-WA   iki-nasai*
    Kyoto-to-TOP/Kyoto-to-TOP     go-imperative
    '(At least) go to KYOto.'

    The function of the contrastive topic is to generate a series of alternatives whose role is to make the hearer speculate why the speaker employs a specific speech act in contrast to other possibilities. This is very similar to the role of contrastive focus. Another common feature is that both contrastive topic (CT) and contrastive focus (CF) have the same prosody (at least in Japanese). This leads Tomioka to reject theories of information structure, where the distinction between CT and CF is primarily related to prosody (Büring 2003). For Tomioka, CT and CF are two focalizing strategies, and the interpretation of CTs is contingent upon the presence of focus.

    Based on the notion of scalar implicatures (Kratzer 1991), the author analyses examples such as (xi) and (xii):

(xi) How many people will come to the party?

    *ZYUU-Nin-wa/ZYUU-nin-WA*    *kuru-desyoo.*
    *TEN*-CL-TOP/Ten-CL-TOP    come-EVID
    '(At least) Ten people will come, (as far as I can tell).'

(xii) How many people will come to the party?

    *ZYUU-Nin kuru-desyoo*
    TEN-CL    come-EVID
    'Ten people will come.'

    In (xi) there is a CT, whereas in (xii) we find a CF. The pragmatic interpretations are thoroughly different. The CT in (xi) has the implicature that at least ten people came, but the implicature of 'exactly ten people' is absent. Note that the latter is exactly the implicature that the CF in (xii) offers.

    Tomioka goes on by proposing that the interpretation of CTs depends on a competition with focus. When the two strategies are compared, focus wins over CT. Furthermore, adopting Fox's (2006) framework, the author claims that another property which distinguishes between CF and CT is that CT is associated with a Speech Act operator, whereas CF is connected with an Exhaustivity operator. The precise mechanism employed to carry out the association processes involves focus indices and selective binding, following Wold (1996), though Tomioka implements this theory to the effect that focus

may be assigned two indices. This accounts for certain implicatures which were not accurately explained before.

Valentina Bianchi and Mara Frascarelli's paper addresses a puzzling issue which is discussed in a research line spanning back to Emonds (1974), namely the root status of topics. This is a long tradition whose main exponents include (though obviously not exhaustively) researchers such as Emonds (2004), Haegeman (2006 et subsequent), Heycock (2006), etc. It is generally assumed that topics are a root phenomenon. Bianchi & Frascarelli cast some doubt on the validity of this generalization, especially once Frascarelli & Hinterhölzl's (2007) topic typology is adopted, according to which topics are divided into three types: Aboutness-Shift, Contrastive and Familiar/Given Topics. In the light of this classification, the question raised by the authors is whether each type of topic is a root phenomenon.

Bianchi & Frascarelli examine the root-based characterization of each type of topic within Krifka's (2007) semantic framework founded on conversational dynamics, in which a distinction is made between Common Ground Management and Common Ground Content. They claim that topics affect the conversational dynamics, thereby occurring in those clauses that have illocutive force. As the authors make clear, this is an interface restriction. Interestingly, this constraint does not hold for all types of topics.

English and Italian embedded topic constituents have been claimed to have different grammatical properties (Haegeman 2006). Bianchi & Frascarelli hold that this distinction can be derived from the fact that Italian CLLD may involve Familiar/Given Topics, whereas they are excluded from English Topicalisation. Given Topics are believed not to affect conversational dynamics since they are not part of the CG management (they belong to the CG content which does not involve any move in illocutive force). The root restriction in English is just a consequence of the unavailability of Given Topics in embedded contexts. This explains, in the authors' view, the contrast in (xiii), taken from Haegeman (2006: 38):

(xiii) a. Se gli esami finali non li superi,     non otterrai     il diploma.
     if the exams final NEG CL pass-PRES.2SG, NEG obtain-FUT.2SG the degree

     'If you don't pass the final exams, you won't obtain the diploma.'

    b.*If these exams you don't pass, you won't get the degree.

Haegeman accounts for this difference by establishing a difference between central and peripheral adverbial clauses. Central adverbial clauses have root-like properties and they need the presence of Force. However, Bianchi & Frascarelli attribute the distinction in (xiii) to the unavailability of dislocated Given Topics in English alongside their claim that the root restriction does not affect Given Topics. Given Topics in English are marked by deaccenting, not by dislocation.

As regards Contrastive Topics, Büring (2003) claims that they are subject to the root restriction, and in case they are embedded topics, they are promoted to the matrix clause for interpretive reasons. Bianchi & Frascarelli call this definition into question by providing extensive evidence that in English Contrastive Topics have an embedded interpretation and that they may occur in non-assertive complement clauses.

Finally Aboutness-Shift Topics are claimed to be thoroughly affected by the root restriction. Following Krifka (2003), Bianchi & Frascarelli hold that this type of topic represents an independent speech act (see Tomioka, this volume) which is formally instantiated in syntax by means of a Speech Act Phrase.

Recapitulating, the answer to the question of whether topic is a root phenomenon depends on what type of topic we are talking about. Given Topics are shown not to be affected by the root restriction, Contrastive Topics may at times be subject to this constraint, and finally Aboutness-Shift Topics fully comply with the root rule.

## REFERENCES

Aboh, Enoch Oladé. 2007. Leftward focus versus rightward focus: the Kwa-Bantu conspiracy, *SOAS Working Papers in Linguistics* 15, 81–104.

Ackema, Peter & Ad Neeleman. 2005. *Beyond Morphology. Interface Conditions on Word Formation*. Oxford: OUP

Belletti, Adriana. 2004. Aspects of the low IP area. In Luigi Rizzi (ed.), *The Structure of CP and IP*. 16–51. Oxford/New York: Oxford University Press.

Büring, Daniel. 2003. On D-trees, Beans and B-Accents, *Linguistics and Philosophy* 26 (5), 511–545.

Cardinaletti, Anna. 2002. Against optional and null clitics. Right dislocation vs. marginalization, *Studia Linguistica* 56 (1), 29–57.

Chomsky, Noam. 1972. Deep structure, surface structure, and semantic interpretation. In Noam Chomsky (ed.) *Studies on Semantics in Generative Grammar*. 69–119. The Hague: Mouton.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

DiSciullo, Anna-Maria. 2005. *Asymmetry in Morphology*. Cambridge, MA: MIT Press.

Emonds, John. (1976). *A transformational approach to English syntax: root, structure-preserving, and local transformations*. New York: Academic Press.

Emonds, John. (2004). Unspecified categories as the key to root constructions. In David Adger, Cecile de Cat & George Tsoulas (eds.), *Peripheries: Syntactic Edges and their Effects*. 75–120. Dordrecht: Kluwer Academic Publishers.

Frascarelli, Mara & R. Hinterhölzl. 2007. Types of topics in German and Italian. In Susanne Winkler & Kerstin Schwabe (eds.), *On Information Structure, Meaning and Form*. 87–116. Amsterdam/Philadelphia: John Benjamins.

Grohmann, Kleanthes K. In press. Transfer vs. spell-out and the road to PF. In A. Sumru Özsoy & Ayşe Gürel (eds.), *Issues in Mediterranean Syntax*. Leiden: Brill.

Haegeman, Liliane. 2006. Argument fronting in English, Romance CLLD and the left periphery. In: Raffaella Zanuttini, Héctor Campos, Elena Herburger and Paul H. Portner (eds), *Cross-Linguistic Research in Syntax and Semantics: Negation, Tense and Clausal Architecture*. 27–52. Georgetown University Press.

Halle, Morris & Alec Marantz. 1993. Distributed Morphology. In Kenneth Hale and Samuel J. Keyser (eds.), *View from Building 20*. 111–176. Cambridge, MA: MIT Press.

Hernanz, Maria Lluisa. 2007. From polarity to modality: some (a)symmetries between *bien* and *sí* in Spanish. In Luis Eguren & Olga Fernández-Soriano (eds.). *Coreference, Modality, and Focus*. 133–170. Amsterdam/Philadephia: John Benjamins.

Heycock, Caroline. 2006. Embedded root phenomena. In Martin Everaert & Hans van Riemsdijk (eds.), *The Blackwell Companion to Syntax, Vol. II*, 174–209. Oxford: Basic Blackwell.

Jackendoff, Ray S. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge, MA: MIT Press.

Jiménez, Ángel. 2009. On the composite nature of subject islands: a phase-based approach, *SKY Journal of Linguistics* 22, 91–138.

Kiss, Catalin E. 1998. Identificational focus versus information focus, *Language* 74, 245–273.

Kisseberth, Charles W. 2010. Optimality theory and the theory of phonological phrasing: the Chimwiini evidence. In Nomi Erteschik-Shir & Lisa Rochman (eds.), *The Sound Patterns of Syntax*. 217–246. Oxford/New York: Oxford University Press.

Kratzer, Angelika. 1991. Representation of Focus. In Arnim von Stechow and Dieter Wunderlich (eds.), *Handbook of Semantics*. 825–834. Berlin: De Gruyter.

Krifka, Manfred 2007. Basic notions of information structure. In Caroline Féry, Gisbert Fanselow, Manfred Krifka (eds.), *Interdisciplinary Studies on Information Structure. Vol. 6.* ISIS, Working Papers of the SFB 632, University of Potsdam.

Miyagawa, Shigeru. 2010. *Why Agree? Why Move? Unifying Agreement-based and Discourse-configurational Languages*. Cambridge, MA: MIT Press, Linguistic Inquiry Monograph 54.

Sebüktekin, Hikmet. 1984. Turkish word stress: some observations. In Eser Erguvanlı-Taylan & Ayhan Aksu-Koç (eds.), *Proceedings of the Turkish Linguistics Conference*. 295–307. Istanbul: Boğaziçi University Publications.

Wold, Dag E. 1996. Long distance selective binding: the case of focus. In Teresa Galloway & Justin Spence (eds.), *Proceedings from Semantics and Linguistic Theory (SALT) 6*, 311–328. Ithaca, NY: Cornell University.

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