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Towards a Taxonomy of Focus Types

The case of Information Foci and Contrastive Foci in Italian

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This paper investigates the semantics of Information focus and Contrastive focus in Italian. Throughout the literature, there have been some recent attempts to show that they both have the same semantic representation at LF. After arguing against these theories, I propose a semantic model for the interpretation of Information Focus and Contrastive Focus, according to which the latter is a subtype of the former, specified for exhaustivity. The model aims to bring together the theoretical advantages of both Rooth's theory for the interpretation of focus and Horvath's proposal about the intervention of an exhaustivity operator in the derivation of Hungarian Contrastive Foci. The purported differences between Italian and Hungarian are explained in terms of constraints on the type of objects which can enter in the domain of application of the exhaustivity operator.

Keywords contrastive focus, information focus, Hungarian, Italian

1 Information foci vs. Contrastive foci: setting the stage

The most striking fact when approaching the literature on focus is the wide variety of specifications that is traditionally given to the term (see Krifka, 2007 as a main reference). In this paper, I will deal in particular with the notions of information focus (IF, henceforth) and of contrastive focus (CF, henceforth). Based on Hungarian data, Kiss (1998) is the first attempt to show in what sense they are two different categories of grammar, associated with two unrelated semantic interpretations[1]. While IFs have the function of marking the new (hence, nonpresupposed) informational status of the corresponding expressions, CFs express exhaustive identification of their referents[2]. This is shown by the contrast between (1) and (2). The former is the answer to the *wh*-question *What did Mary pick for herself?*. The IF corresponds to the *wh*-operator and, accordingly, carries new information. Furthermore, it is neither associated with an exhaustive interpretation nor with the assumption that the entity denoted by the

[1]While discussing Hungarian and English sentences, Kiss uses the label *Identificational Focus* instead of *Contrastive Focus*. I will continue to use the latter label, since the discussion is not affected at all by the terminological shift.

[2]Using Kiss's words "an identificational focus represents a subset of the set of contextually and situationally given elements for which the predicate phrase can potentially hold; it is identified as the exhaustive subset of this set for which the predicate phrase actually holds" (see Kiss, 1998: 254)

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phrase *a hat* belongs to a set of alternatives. On the contrary, the latter expresses that, among the contextually relevant objects, Mary picked herself *a hat* and nothing else.[3]

(1) Mari ki nézett magának ***egy kalapot***.
Mary picked for herself ***a hat***

(2) Mari **EGY KALAPOT** nézett ki magának.
Mary a hat.ACC picked out herself.ACC
It was **A HAT** that Mary picked for herself.

Kiss notices that these data challenge the analysis proposed by Krifka (1992), according to which both (1) and (2) have the semantic representation indicated in (3). The formula represents both sentences as partitioned between a background denoting the set of entities for which the predicate *to be picked by Mary for herself* can potentially hold and a focus referring to the entity for which the predicate actually holds. Thus, the formula is inappropriate in two respects: a) it represents the IF as a member of a set of alternatives; b) it does not capture the exhaustivity associated with CFs.

(3) ASSERT (<λ *x. picked for herself* (Mary,x), a hat>)

Interestingly, each of the two informational categories correlates with specific syntactic and prosodic properties. For example, CFs move to a dedicated functional projection within the left-periphery of the sentence, while IFs generally remain *in-situ*. Throughout the literature, it has often been claimed that also Italian distinguishes between CFs and IFs (see Zubizarreta, 1998 as a main reference). For example, each of the two notions is licensed by a specific discourse context, as (4) and (5) aim to show.

(4) a. Chi ha invitato alla festa?
Who did he invite to the party?
b. Ha invitato ***Mario***.
He invited ***Mario***.

(5) a. Ha invitato ***Gianni***.
He invited Gianni.
b. **MARIO** ha invitato (non Gianni).
It was **MARIO** that he invited – not Gianni.

The constituent *Mario* serves as an IF in (4) and as a CF in (5). Crucially, CFs cannot be felicitously used in the same contexts as IFs and vice versa. Thus, (5b) cannot be uttered as an answer to (4a) and, likewise, (4b) turns out to be odd if it is uttered after (5a).

Speaking in pre-theoretical terms, one has the impression that the IF in (4) and the CF in (5) perform the same semantic function of specifying a value for a variable contained in an open-formula drawn from the discourse context. In effect, the

[3]Throughout the paper, CFs will be indicated through **CAPITALS AND BOLD FONTS**, while IFs through ***italics and bold fonts***.

constituent *Mario* in both cases assigns a value to the variable in the formula *he invited x*. However, CFs seem to have an additional function, i.e. the function of denying that the value of the variable is the one introduced by the previous utterance. For example, the CF in (5b) serves both to negate that *Gianni* in (5a) is the value of the variable and to introduce an alternative to it (crucially, this function is performed also without making use of the negative tag in parentheses). This implies that CFs can be felicitously used only whenever the context contains (at least) two propositions assigning different values to the same variable.

In order to account for these differences, Kiss extends her analysis of Hungarian IFs and CFs to Italian. Accordingly, the constituent Mario is taken to convey new information in (4) and to express exhaustivity in (5). Moreover, the author claims that Italian CFs must be discourse-linked, i.e. they must belong to a closed set of entities whose members are known to the participants in discourse (which is not necessary for their Hungarian counterparts). However, Kiss's hypothesis on Italian CFs has to be conceived of as a first provisional attempt to apply the abovementioned analysis of Hungarian data to other languages. In effect, the arguments are supported by little empirical evidence.

In recent years, it has been tried to challenge this kind of analysis. In particular, the claim that Italian CFs express exhaustivity does not seem to fit well with empirical data, as it will be shown in section 2. More in general, the hypothesis that IFs and CFs are two completely different categories of grammar does not capture the abovementioned generalization that they share the linguistic function of assigning a value to a variable. In light of these considerations, some authors have reached the opposite conclusion to the one in Kiss (1998), viewing focus in Italian as a unitary phenomenon (see section 3), along the lines of the semantic representation given in (3). The different interpretations triggered by IFs and CFs (as in (4) and (5) respectively) stem from factors which are outside the domain of grammar, i.e. from inferences drawn on the basis of given conversational contexts (see Brunetti, 2004 as a main reference). To conclude, it is appropriate to notice that Italian IFs and CFs undergo different syntactic and phonological encodings (as in the case of Hungarian), which is likely to provide indirect evidence of their being two distinct notions within the grammar. As for the syntax, IF sits in its base position (or, alternatively, is located in the clause-internal Focus position (see Belletti, 2004 on this last issue), while CF moves to the specifier of the left-peripheral Focus projection (FocP, henceforth). The sentence (6) shows that CFs can also appear *in-situ*.

(6) Ha invitato **MARIO** (non Gianni). (He invited **MARIO** – not Gianni).

However, I assume that the derivation of this sentence involves movement of the CF to FocP followed by remnant movement of the IP above it, in accordance with Belletti's assumption that the interpretation of a constituent as CF is available only in correspondence with FocP[4]. Therefore, IF and CF are located in two different syntactic positions. As for the phonology of IFs and CFs, see Bocci (to appear) who

[4]Belletti's (2004) hypothesis is corroborated by the fact that *in-situ* contrastively focused subjects cannot be NPI-licensed by a c-commanding negation, as in (ii), which shows that the CF is higher than the IP-internal negation.
(i) ?? Non hanno detto che **I LINGUISTI** la verità. (taken from (Belletti, 2004)).

shows that the former are expressed by means of a H+L* pitch-accent, while the latter by means of a L+H* pitch-accent. Obviously, the major challenge for those who claim that focus is a unitary phenomenon is to explain where the difference in the linguistic encoding of both notions stems from.

To summarize, two main hypotheses have been proposed to account for the relation between IFs and CFs in Italian: i) IFs and CFs have two completely different semantic representations; ii) IFs and CFs have the same semantic representation.

The goal of this paper is to pursue a third line of investigation, according to which both IFs and CFs can be analyzed in terms of the general theory of focus semantics proposed in Rooth (1992), for which I refer to section 4. I will show, however, that CFs are endowed with an additional semantic property, i.e. exhaustivity. To this purpose, I will review the abovementioned arguments against the possibility of analyzing Italian CFs in terms of exhaustivity and I will elaborate an explanation for the differences between Hungarian and Italian CFs (see section 5). This proposal is inspired by the analysis of Hungarian CFs recently introduced in Horvath (2010). It mixes the advantages of both i) and ii). Like i), it is able to account for the different semantic interpretations associated with IFs and CFs respectively. Like ii), it relies on only one notion of focus, i.e. IF. CFs are viewed as derived notions, since their semantic content stems from the interaction between the semantics of the IF and that of an exhaustivity operator.

2 Italian foci and Hungarian foci: a comparison

In this section, I aim to apply to Italian data all the diagnostics of which Kiss makes use in order to verify if a constituent is endowed with an exhaustive interpretation. Before introducing the data, some clarifications are in order. Italian will be compared sometimes with Hungarian and sometimes with English, in accordance with Kiss's claim that the latter languages pattern the same with respect to the semantic interpretation of both CFs and IFs. The English and Hungarian sentences all come from Kiss (1998).

The first test (to which I will refer as the Entailment Test - *EntTest*) is built around the observation that a proposition containing an IF made out of two coordinated DPs (see (7)) entails a proposition in which only one of the two DPs appears (see (8)). The examples show that this holds true both for English and for Italian sentences (see (9)).

(7) Mary picked ***a hat and a coat*** for herself.

(8) Mary picked ***a hat*** for herself.

(9) Maria comprò ***un cappello e un cappotto*** → Maria comprò ***un cappello***.
Mary picked ***a hat and a coat*** → Mary picked ***a hat***.

However, the entailment relation between the two sentences ceases to exist once the constituents have been given an exhaustive interpretation. Thus, (11) is not a logical consequence of (10). Rather, the former contradicts the latter.

(10) It was **A HAT AND A COAT** that Mary picked for herself.

(11) It was **A HAT** that Mary picked for herself.

Let me consider now the exchange in (12). The first sentence in (12c) contradicts (12b) (as the negative tag shows). Hence, the *EntTest* also applies to Italian data[5].

(12) a. Ho saputo che Maria e Michele hanno vinto la gara.
I heard that Maria and Michele won the race.
b. No, **SIMONA E GIANNI** hanno vinto la gara.
No, it was **SIMONA E GIANNI** that won the race.
c. No, **SIMONA** ha vinto la gara. Gianni è stato squalificato.
No, it was **SIMONA** that won the race. Gianni was disqualified.

The second test (to which I will refer to as the Denial Test – *DenTest*) is centered around a sentence which denies the exhaustivity interpretation conveyed by the immediately preceding one. If the exhaustivity interpretation is not present in the latter, then the former turns out to be inappropriate in the discourse context. Thus, (15) is a felicitous continuation of (13) but not of (14).

(13) It was **A HAT** that Mary picked for herself.

(14) Mary picked ***a hat*** for herself.

(15) No, she picked a coat too.

Contrary to what happened with the *EntTest*, the *DenTest* does not apply to Italian data. In effect, the sentence (18) seems to be infelicitous as a continuation of both (16) and (17). At first glance, this datum constitutes empirical evidence against the hypothesis that Italian CFs express exhaustivity.

(16) **IL CAPPELLO** ha comprato Maria.
It is **THE HAT** that Maria bought.

(17) Maria ha comprato ***il cappello***.
Maria bought ***the hat***.

(18) No, ha comprato anche il cappotto.
No, she bought the coat too.

(taken from Brunetti, 2004)

Incidentally, it has to be noticed that Hungarian CFs can also appear in answers to *wh*-questions, whenever the speaker intends to convey an exhaustive interpretation (cf. (19) as opposed to (20)). On the contrary, Italian CFs are generally not appropriate answers to *wh*-questions, as has been noticed above discussing the examples (4) and (5). I will return to this datum at the end of section 5.

(19) a. Hol jártál a nyáron?
Where did you go in the summer?

[5] Brunetti (2004) does not apply the *EntTest* to Italian data. It would be interesting to know how to account for the datum in (12c) within her theory, according to which IFs and CFs undergo the same semantic representation at LF.

b. **OLASZORSZÁGBAN** jártam.
It was **TO ITALY** where I went.

(20) a. Hol jártál a nyáron?
Where did you go in the summer?
b. Jártam ***Olaszországban***.
I went to ***Italy*** (among other places)

As a last point, the exhaustive interpretation which is associated with Hungarian CFs determines lexical restrictions on the type of constituents that can actually function as CFs and has visible effects on scope configurations.

As for the first issue, Kiss notices that some expressions cannot serve as CFs, e.g. universal quantifiers (21), existential quantifiers (22), *also/even*-phrases (23). In effect, their semantics is incompatible with the operation of "exclusion by identification", which has been shown to be performed by CFs in general. On the contrary, the same expressions can function as IFs with the only exception of existential quantifiers.

(21) * It was **EVERY HAT** that Mary picked for herself.

(22) * It was **SOMETHING** that Mary picked for herself.

(23) * It was **ALSO A HAT** that Mary picked for herself.

Crucially, all these types of constituents can serve as both IFs and CFs in Italian, as (24)-(26) show [6].

(24) a. Ho saputo che la professoressa ha bocciato qualcuno.
I heard that the professor rejected someone.

[6]It is worth spending a few words on the difference between Italian and Hungarian with respect to the possibility for IFs and CFs to be expressed by existential quantifiers. According to Kiss, existential quantifiers can serve neither as IFs nor as CFs in Hungarian. However, it is not entirely clear whether the author refers to *some-phrases* in general or only to bare quantifiers (*something/somebody*). In the latter case, the same generalization holds for Italian, as is shown by the marginality of (1b) where the bare quantifier is an IF and (2b) where the bare quantifier is a CF. On the contrary, the corresponding sentences containing *some-phrases* are both grammatical (see (1c) and (2c), respectively). I leave the issue concerning *some-phrases* in Hungarian open for further research.

(1) a. Chi hai incontrato in università?
(Who did you meet at the University?
b. ?? Ho incontrato ***qualcuno***
I met ***somebody***
c. Ho incontrato ***alcuni studenti***
I met ***some students***

(2) a. Ho saputo che non hai incontrato nessuno.
I have heard that you met nobody.
b. ?? No, **QUALCUNO** ho incontrato.
No, it is **SOMEBODY** that I met.
c. No, **QUALCHE AMICO** ho incontrato.
No, it is **SOME FRIEND** that I met

b. No, **TUTTI** ha bocciato.
No, it was **EVERYONE** that she rejected.

(25) a. Ho saputo che hai litigato con tutti.
I heard that you quarreled with everyone.

b. No, **CON ALCUNI** ho litigato.
No, it was **WITH SOMEONE** that I quarreled.

(26) a. La sciarpa l'ha comprata Maria.
As for the scarf, it is Maria who bought it.

b. **ANCHE/PERSINO IL CAPPELLO** ha comprato Maria.
It is **ALSO/EVEN THE HAT** that Maria bought.

At last, I will consider data concerning scope phenomena. Kiss notices that CFs can take scope, claiming that this is due to exhaustivity interacting with other semantic operators, e.g. universal quantifiers. This is shown in sentences (27) and (28).

(27) Minden fiú **MARIVAL** akart táncolni.
every boy Mary.with wanted to.dance.
For every boy, it was **MARY** (of the relevant persons) that he wanted to dance with.

(28) **MARIVAL** akart táncolni minden fiú.
It was **MARY** (of the relevant persons) that every boy wanted to dance with.

In (27) the universal quantifier takes scope over the exhaustive identification. Accordingly, the proposition describes a situation in which every boy wanted to dance with only one of the girls, i.e. Mary. On the contrary, the exhaustive identification in (28) outscopes the universal quantifier and the proposition describes a situation in which Mary is the only girl that every boy wants to dance with but other girls may have been asked for a dance by a smaller subset of the boys (see Kiss, 1998: 254). Crucially, the scopal properties of IFs are completely independent of their being IFs. The sentence in (29) has the only reading in which the universal quantifier takes scope over the IF and no other scope configuration is possible.

(29) Minden fiú táncolni akart ***a szépségkirálynövel***.
Every boy wanted to dance ***with the beauty queen***.

Once again, Italian CFs seem to behave differently. According to Brunetti (2004), both (30) and (31) have the only reading in which the universal quantifier outscopes the CF constituent, which is a cue that no exhaustivity identification is involved in the interpretation of CFs. The same happens if the constituent is an IF.

(30) Ogni ragazzo **CON MARIA** voleva ballare.
For every boy, it was **WITH MARY** that he wanted to dance.

(31) **CON MARIA** voleva ballare ogni ragazzo.
It was **WITH MARIA** that every boy wanted to dance.

To conclude, table 1 and table 2 summarize what has been said thus far. The diagnostics introduced in this section aimed to verify if the target constituents (either IFs or CFs) were associated with an exhaustive interpretation (for the double-indexing at the voice *existential quantifiers* in both tables, see footnote 6).

	Hungarian/English	Italian
EntTest	×	×
DenTest	×	×
universal quantifiers	✓	✓
existential quantifiers	×/?	× / ✓
also-phrases	✓	✓
scope variation	×	×

Table 1: Summary of the differences in the interpretation of IFs between Hungarian/English and Italian.

	Hungarian/English	Italian
EntTest	✓	✓
DenTest	✓	×
universal quantifiers	×	✓
existential quantifiers	×/?	× / ✓
also-phrases	×	✓
scope variation	✓	×

Table 2: Summary of the differences in the interpretation of CFs between Hungarian/English and Italian.

Table 1 clearly shows that both Italian and Hungarian IFs do not convey exhaustivity. On the contrary, the results in table 2 suggest that exhaustivity is part of the semantic content of only Hungarian CFs. Also the comparison between Italian IFs (table 1) and CFs (table 2) is revealing. Apart from the *EntTest*, they appear to behave alike. As has been mentioned, all these data led some authors to claim that, contrary to what happens in Hungarian, Italian IFs and CFs have the same semantic representation at LF (see (3) above). With this regard, in the next section I will discuss Brunetti (2004), which argues for a hypothesis along these lines.

3 Towards a unitary semantics of focus: some theoretical proposals

As has been previously mentioned, Brunetti (2004) aims to develop a unitary account of focus, according to which both IFs and CFs undergo the same semantic representation at LF. In effect, the data introduced in the previous section do not hint at the presence of any semantic property according to which they differ. On the contrary, Hungarian CFs differ from IFs in that they express exhaustivity, thus

affecting the truth-conditions of the sentences in which they appear. Therefore, Brunetti claims, there is no need to treat Italian CFs and IFs as two distinct semantic notions. Rather, they are instances of a unique category of grammar, i.e. focus, whose function is to express new information. The abovementioned impression that CFs trigger an additional interpretive effect, i.e. they introduce their referents as alternatives to previously mentioned ones, stems only from contextual factors. For example, the constituent *ravioli* in (32) expresses new information both as an answer to (33) and to (34). However, the additional "contrastiveness" effect which is conveyed in the former case depends only on how the preceding question is formulated, thus having nothing to do with the semantics of focus.

(32) I ate ***ravioli***/I ate **RAVIOLI**.

(33) You ate spaghetti, didn't you?

(34) What did you ate for Christmas?

I am not very sympathetic with the theories that reduce contrast to a merely pragmatic/cognitive phenomenon. Rather, I assume that contrast has a specific semantic import and is encoded by specific linguistic means (I refer to Torregrossa, 2011 for further details).

Moreover, Brunetti's hypothesis is not able to account for the difference between (36) and (37),which are both appropriate answers to the question in (35), even if they express different meanings. As expected, they both assign the value *Carlo* to the variable in the open-formula *He invited x*. However, (37) denies the contextually relevant sentence *He invited Carlo and Michele* (and, consequently, the fact that Michele has been invited), while (36) is compatible with a situation in which Michele has been invited as well (for example, the speaker might not know whether or not this is the case).

(35) Hai invitato Carlo e Michele?
Did you invite Carlo and Michele?

(36) Ho invitato ***Carlo***.
I invited ***Carlo***.

(37) **CARLO** ho invitato.
It was **CARLO** that I invited.

If Brunetti's hypothesis is correct (i.e. if it is true that contrastiveness effects stem only from contextual factors), it is not clear where the difference in the semantic interpretation of *Carlo* in (36) and (37) respectively comes from, since the same question (hence, the same linguistic context) precedes both utterances. (36) and (37) also challenge Kiss's (1998) theory on Italian foci, according to which the property of being D-linked distinguishes CFs from IFs (see section 1). The referent of *Carlo* is drawn from the same contextually relevant set (i.e. Carlo and Michele) in both cases (it is, thus, D-linked). Nevertheless, the target constituent is an IF in (36)and a CF in (37).

My view on the relation between IFs and CFs follows the proposal sketched in Horvath (2006; 2010). It is worth mentioning it here, since, like Brunetti (2004),

it is grounded on the assumption that there is no need to introduce two notions of focus. However, instead of ascribing the same semantic representation to IFs and CFs, Horvath claims that the latter are derived notions, stemming from the interaction of the semantics of IFs with that of a truth-conditional operator (the exhaustivity operator - EIOp). Therefore, a theory which aims to be economical might exclude CFs from the inventory of relevant informational categories and explain the different semantic and syntactic effects which have been traditionally associated with them (i.e. exhaustive interpretation and movement of the corresponding constituent to the left periphery) in terms of this interaction. Let me consider a very simple example taken from Horvath (2006).

The sentence (39) is an appropriate answer to (38) if the speaker intends to express an exhaustive interpretation.

(38) To whom did you introduce John?

(39) **[AZ UNOKAHÚGOMNAK]** mutattam be Jánost.
I introduced John **TO MY NIECE**.

Horvath claims that the EIOp is a focus-sensitive operator and, consequently, requires a focus in its domain. In the case of (39), the scope of the operator is the constituent *to my niece*, which is the IF of the sentence, since it answers the *wh*-question. However, it is not necessary for the EIOp to associate with the IF of the sentence. For example, it is possible to utter (39) also if the sentence is all-focused (e.g. if it answers a question like *What happened?*), provided that the niece is still the only individual to which John has been introduced. In section 5, I will provide other evidence in favor of this last claim, since it is at the core of my explanation of the differences between Hungarian and Italian CFs.

In (39) the movement of the constituent *to my niece* is triggered by the EIOp which sits in the clausal left periphery. Interestingly, the movement has the additional function of marking the domain of quantification of the exhaustivity operation, which turns out to be the set of contextually relevant entities to which the speaker introduced John.

Horvath's proposal about the linguistic nature of CFs is part of a larger syntactic project aiming to reduce the formal features which are active in the computation to those encoding truth-conditional notions, just like exhaustivity. My interest here is mainly in the semantic interpretation of CFs and IFs and I will not enter in the details of the syntactic implementation. However, I will discuss other aspects of Horvath's papers in the next sections, aiming to verify the cross-linguistic validity of her hypothesis about the exhaustivity operator through its application to Italian data.

Up to now, I have investigated whether grammar makes a distinction between CFs and IFs, dealing mostly with Hungarian and Italian. As for Hungarian, Kiss provides a large amount of data that show that IFs and CFs have two completely different semantic representations. However, the author does not specify whether they share some property, which would justify their being both referred to as foci. Elaborating on this issue, Horvath got rid of one of the two categories, i.e. CF, claiming that the interpretive effects associated with the use of it can be explained by resorting to an operation of exhaustivity, which is an autonomous semantic notion interacting

with IF only indirectly. Italian has been shown to behave differently from Hungarian, making apparently no distinction between IFs and CFs. However, this last assumption does not fit with the intuition that they actually trigger different semantic/pragmatic effects, as shown by the contrast between (4)-(5) and (36)-(37). Moreover, the attempts that have been made to explain where the differences between the two notions stem from have been noticed to run into serious difficulties.

In face of these observations, I will outline my model of the semantics of IFs and CFs, aiming to show how they relate to each other. In particular, I will extend Horvath's hypothesis that CFs are a subtype of IFs to Italian data. Before doing this, however, it is necessary to indicate which semantics of IFs will be assumed in the next discussion. This is what the next section is about.

4 The semantics of IF and CF: what do they have in common and how do they differ?

This section does not intend to cover all aspects of Rooth's (1992) model for the interpretation of focus. Rather, I prefer to explain how his theory works by analyzing the question/answer pair which has been introduced in (4a)-(4b) and is repeated here as (40a) and (40b).

(40) a. Chi ha invitato alla festa?
Who did he invite to the party?
b. Ha invitato ***Mario***.
He invited Mario.

In (40b) the constituent *Mario* is the IF, since it corresponds to the *wh*-operator in the preceding question. Whenever a sentence contains a focus-marked expression, an additional semantic value is added to its ordinary semantic value. This additional semantic value is called focus semantic value (FSV, henceforth). Assuming that the ordinary semantic value of a sentence is a proposition, its FSV is "the set of propositions obtainable from the ordinary semantic value by making a substitution in the position corresponding to the focused phrase" (Rooth, 1992: 76). For example, the FSV of (40b) is the set of propositions of the form "I invited x to the party".

Let me now consider which role the FSV actually plays in the semantic interpretation of (40b). According to Rooth, focus interpretation requires a focus semantic operator to be adjoined to the phrase at which focus is actually interpreted. In (40b) focus is interpreted at the sentence level. Accordingly, the operator is adjoined to the sentence. The role of the operator is twofold: a) it binds a variable of the same type of the constituent to which it is adjoined (i.e. a variable of propositional type in the example at stake); b) it introduces a presuppositional constraint, according to which the variable is taken to be a subset of the FSV of the constituent, containing its ordinary semantic value and at least one other element. In other terms, the variable introduced by the focus interpretation operator looks for an appropriate antecedent in the linguistic context. The meaning of a sentence is, thus, computed against a set of contextually relevant alternatives (i.e. the set denoted by the variable is restricted in relation to contextual factors).

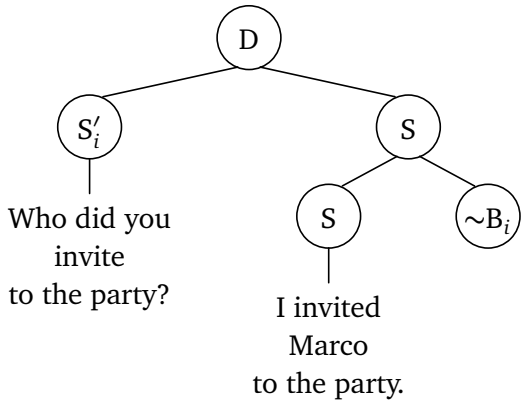

Figure 1

The diagram in figure 1 represents how Rooth's theory applies to the question/answer pair in (40a)-(40b). (41) is the semantic value of the question (40a), assuming a Hamblin/Karttunen denotation of questions (i.e. the set of propositions that are possible answers in a given world, see (Hamblin, 1973)). (42) is the FSV of (40b).

(41) $\{invite - to - the - party\ (I,x) \mid x \in E\ \&\ person(x)\}$

(42) $\{invite - to - the - party\ (I,x) \mid x \in E\}$

The label D stands for the discourse node. According to what has been said thus far, focus is interpreted at the sentence level. This gives a variable B_i of propositional type. The presupposition introduced by the focus operator is satisfied only if the variable B is a subset of the FSV of S (indicated in (42)), containing both the ordinary semantic value of S and a semantic object distinct from it. Since the ordinary semantic value of the question is a subset of the FSV of the answer, the former is likely to be an appropriate antecedent for the variable B (as has been indicated by the indexing).

Crucially, I assume that Rooth's theory provides a model for the interpretation of focus constituents in general, no matter if they are IFs or CFs. In effect, the representation in figure (1) can be applied also to the sentence (43b), the only difference being that the contextually relevant alternative to be written under the node S'_i is the sentence (43a) instead of the question (40a), whose meaning is a set of propositions.

(43) a. Ha invitato Gianni alla festa.
He invited Gianni to the party.

b. **MARIO** ha invitato (non Gianni).
It was **MARIO** that he invited – not Gianni.

The FSV of (43b) is the same as the one of (40b) (see (42)) and the variable introduced by the focus operator is its subset, containing both the ordinary semantic

value of (43a) and the ordinary semantic value of (43b).

Let us recall now what was mentioned in the first section: CFs can be felicitously used only in contexts containing (at least) two propositions that assign different values to the same variable, one of which is the proposition containing the CF itself. In line with my previous assumptions, these are the propositions which the set denoted by the variable bound by the focus operator is made of.

Therefore, it seems that I am making the assumption that CFs differ from IFs in that the set of propositions which is identified by the process of focus interpretation is more restricted. Accordingly, one could object that my proposal does not introduce any substantial change in Kiss's dichotomy between open vs closed set. Thus, the proposal would not be able to overcome the difficulties in the analysis of sentences like (36)-(37).

However, I assume that the semantic model for the interpretation of focus is able to account for only part of the meaning of CFs. In the first section, I mentioned that sentences containing a CF are used to correct an immediately preceding utterance. In other terms, they perform an additional function with respect to IFs, i.e. they negate the previous utterance in discourse.

Resorting to the notion of exhaustivity (or, more appropriately, to the operation of exclusion by identification) is particularly useful to account for this additional semantic function of CFs.

The general idea is that the proposition containing the CF is selected as the only true one among the set of contextually relevant propositions generated by the process of focus interpretation. This operation is performed by an exhaustivity operator (EIOp). I assume that its semantics is the same as the one of the operator introduced by Chierchia, Fox, and Spector (2007) in order to explain how scalar implicatures are derived within the grammar. (44a)-(44b) show how the theory works with (43). EIOp combines with the sentence containing the CF (i.e. (43b)) and the set of its alternatives and returns (44b), i.e. the conjunction of the sentence with the negation of the alternatives. The semantic representation in (44a) clearly shows that the set of alternatives is the one generated by the process of focus interpretation. In effect, it is a proper subset of the FSV of the sentence *he invited Mario*, containing its ordinary semantic value and that of its contextually relevant alternative.

(44) a. $\text{EIOp}_{\textit{he invited Mario to the party, he invited Gianni to the party}}$ he invited Mario to the party.
b. he invited Mario to the party and he did not invite Gianni to the party.

Moreover, in line with Chierchia/Fox/Spector, I assume that the alternatives which are negated should not be entailed by the target sentence. This is trivially true for (43b). The point emerges more clearly when considering the contrast between (36), repeated here as (45), and (46).

(45) a. Ha invitato Carlo e Michele?
Did he invite Carlo and Michele?
b. **CARLO** ha invitato. (non Carlo e Michele).
It is **CARLO** that he invited. (not Carlo and Michele).

(46) a. Ha invitato Carlo?
Did he invite Carlo?
b. ?? **CARLO E MICHELE** ha invitato (non Carlo).
It was **CARLO AND MICHELE** that he invited - not Carlo.

The marginality of (46b) is explained by the fact that *he invited Carlo and Michele* entails the contextually relevant alternative *he invited Carlo*.[7] Crucially, this is not the case of (45b), where *he invited Carlo* does not entail *he invited Carlo and Michele*. The formula in (47) below refers to the content of an assertion containing a CF, summarizing what has been said thus far. The EIOp applies truly to the sentence S iff both S and (among the alternatives to S) the propositions entailed by S are true.

(47) $[\text{ExhOpALT(S)}]^w = 1$ iff $[\text{S}]^w = 1$ and $\forall\phi \in \text{ALT}\ (\phi(\text{w}) = 1 \rightarrow ([\text{S}] \subseteq \phi))$

The proposed analysis views the semantics of CFs as dependent on the semantics of IFs. More specifically, CF is an IF specified for exhaustivity. Thus, focus turns out to be a unitary phenomenon (in accordance with Brunetti, 2004, Horvath, 2006; 2010) and its semantics is analyzed according to Rooth's (1992) model for focus interpretation. Then, it is the semantic category of exhaustivity that explains the additional semantic effects which are associated with the use of CFs. Moreover, it has been noticed that explaining the difference between IFs and CFs by appealing to the notion of D-linking is often misleading. According to my proposal, D-linking could be considered as a secondary effect of the semantics of focus, whose interpretation requires the presence of a contextually relevant set of propositions.

Before introducing empirical evidence in favor of this hypothesis, it is necessary to clarify a phenomenon that is generally misunderstood. Let me consider again (36) and (37) and the minimal pair in (49)-(50). It can be objected that the exhaustivity interpretation arises also in correspondence with the IFs in (36) and (49). Hence, the sentences can be interpreted as meaning that only *Carlo* (or only *Marco*) has been invited to the party (and, actually, this would be the most straightforward interpretation of the sentence). Thus, exhaustivity seems to enter into the semantic computation of IFs, contrary to my proposal that only CFs convey this semantic interpretation.

(48) Ha invitato Marco e Davide?
Did he invite Marco and Davide?

(49) Ha invitato ***Marco***.
He invited ***Marco***.

(50) **MARCO** ha invitato.
It was **MARCO** that he invited.

However, notice that (51) is an appropriate continuation of (49) but not of (50).

[7] Following Groenendijk and Stokhof (1984), I assume that the denotation of a yes/no question is the set of two mutually exclusive propositions, i.e. P and $\sim P$. The former serves as the antecedent to the variable bound by the focus operator, which ends up denoting the set of propositions {he invited Carlo; he invited Carlo and Michele}, a proper subset of the FSV of the target sentence.

(51) . . . e forse ha invitato anche Davide.
. . . and, perhaps, he also invited Davide.

This suggests that the exhaustive interpretation associated with (49) stems from a conversational implicature and, consequently, is defeasible, as (51) shows. On the contrary, the exhaustivity interpretation conveyed by (50) is part of the truth-conditional content of the sentence and can be cancelled only by contradiction (as it will be shown in the next section by means of (58) and (59)).

To conclude, my analysis of the difference between IFs and CFs is likely to elegantly explain most of the phenomena which are associated with the use of one or the other category. However, before reaching a definitive conclusion, one has to explain why Hungarian and Italian CFs behave differently from each other (see section 2), although they both involve the presence of the EIOp. I will discuss this issue in the next section.

5 Italian and Hungarian CFs: where do the differences stem from?

Section 2 contains a list of properties that distinguish Hungarian CFs from Italian ones, which challenge my proposal that the EIOp is involved in the derivation of both of them. I report here table 2 for a brief summary.

	Hungarian/English	Italian
EntTest	✓	✓
DenTest	✓	×
universal quantifiers	×	✓
existential quantifiers	×/?	× / ✓
also-phrases	×	✓
scope variation	✓	×

Table 2: Summary of the differences in the interpretation of CFs between Hungarian/English and Italian.

I assume that the differences between the two languages stem from the restrictions that work in Italian on the type of objects which could enter in the domain of application of the exhaustivity operator. The EIOp is a focus-sensitive operator and operates on a domain of quantification. Horvath (2006) shows that the EIOp in Hungarian is free to associate with different phrasal categories, i.e. DPs, PPs, VPs and CPs and, consequently, it can take scope over sets of objects, sets of properties or sets of propositions, respectively. Crucially, it is not necessary for these constituents to be the IFs of the sentences to which they belong (as has been already mentioned in section 3). Let me consider (52)-(53) as an example ((52) provides the context).

(52) My friend went to a party to meet a bunch of other friends, but at the end he only met Gianni. The day after I meet him. Since he is sad, I ask him: Why are you so sad? What happened? He answers (53).

(53) **GIANNIVAL** találkoztam a partyn.
It was **GIANNI** that I met at the party.

The question *What happened?* requires a broad focus sentence as an answer. Therefore, the constituent *Giannival* is not the IF of the sentence (or, better, it is only part of it). Horvath (2006) makes the same point by considering (54), in which the EIOp associates with a constituent which is not the IF of the sentence, but is part of the discourse presupposition. The movement of the constituent *Marit* to the left periphery (which is indicated by the trace) is triggered by the null EIOp, as in the previously analyzed cases.

(54) MINDEN fiú **MARIT** kérte fel *t* táncolni (nemcsak a barátja).
(For all x, x a boy, it was Mary that x asked to dance – not only for her boyfriend was it Mary that he asked to dance).
Presupposition: $\exists x$ *it was Mary that x asked to dance*

In (54) the universal quantifier is the IF of the sentence, as is indicated by the presupposition. The presupposition contains the constituent *Mary* over which the operation of exhaustive identification is performed. Importantly, this example does not pose any problem to the assumption that the EIOp always associates with focus. *Mary* could be considered a second occurrence focus (see Partee, 1991 as a main reference on this issue). The only function of the examples (53) and (54) is to show that it is not necessary for the focus associated with the EIOp to be the IF of the sentence. Hence, the semantics of the EIOp does not necessarily interact with the one of the IF.

Crucially, the Italian counterpart of (53) uttered within the context described in (52) results in marginality.

(55) ?? **GIANNI** ho incontrato al party.

This leads me to assume that the EIOp in Italian takes scope only over sets of propositions (hence, it is not free to associate with different phrasal constituents) and, more specifically, over those contextually relevant propositions generated by the process of focus interpretation (as has been shown in section 4). Obviously, the focused phrase could vary from a single constituent to the whole sentence, depending on its FSV. For example, I showed that the contextually relevant set associated with the sentence (43) above is {he invited Mario; he invited Gianni}, while the one corresponding to (58) below is {he fell down the stairs; he had an accident with his moto}, since the preceding question requires an all-focused sentence as an answer.

(56) Gianni has broken his leg. I ask what happened to him.

(57) E' caduto dalle scale.
He fell down the stairs.

(58) No, **HA AVUTO UN INCIDENTE IN MOTO**
No, **HE HAD AN ACCIDENT WITH HIS MOTO**

The next step of the analysis will be to investigate if the difference in the properties of the EIOp in Italian and Hungarian can explain the different interpretive effects triggered by Italian and Hungarian CFs respectively (see table 2).

Speaking about the *DenTest* in section 2, I noticed that (60a) is not a felicitous continuation of (59a), contrary to the English/Hungarian counterpart (59b)-(60b).

(59) a. **IL CAPPELLO** ha comprato Maria.
b. It is **THE HAT** that Mary bought.

(60) a. ?? No, ha comprato anche il cappotto.
b. No, she bought the coat, too.

It is worth noticing that (60a) is infelicitous if (59a) is preceded by (61), but it is felicitous if it is preceded by (62).

(61) Maria ha comprato la sciarpa.
Mary bought the scarf.

(62) Maria ha comprato il cappotto.
Mary bought the coat.

This is predicted by the theory proposed here. The domain of quantification of the EIOp in Italian is the set of propositions generated by the process of focus interpretation. In the case of the exchange (61)-(59a), this set is {Mary bought the scarf; Mary bought the hat} and (59a) expresses that, of the two, only *Mary bought the hat* is true. Thus, (60) is infelicitous, since Mary bought the coat is not part of the domain of quantification of the EIOp. On the contrary, if the contextually relevant set is {Mary bought the coat; Mary bought the hat}, i.e. if (59a) is preceded by (62), (60) turns out to be felicitous. In other terms, the exhaustivity associated with Italian CFs has to be relativized to the contextually relevant set of propositions generated by the process of focus interpretation. On the contrary, no similar constraint applies to the domain of quantification associated with the EIOp in Hungarian. In (59b), the EIOp operates on a set of objects for which the predicate *Maria bought x* potentially holds and it is affirmed that only *the hat* has the property at stake. This renders the continuation in (60b) felicitous, no matter which assertion precedes (59a).

The data concerning existential and universal quantifiers also receive a straightforward explanation within my proposal. The example (21), repeated here as (63) shows that both the universal quantifier and the EIOp operate on a set of contextually relevant hats.

(63) * It was **EVERY HAT** that Mary picked for herself.

The EIOp takes the DP *every hat* in its scope. The universal quantifier performs identification without exclusion (see Kiss, 1998: 252), while the EIOp exclusion by identification. The two semantic operations are incompatible with each other and lead to a contradiction.

This problem does not arise in Italian, since the EIOp takes scope over the proposition (and not over only one of its constituents). As in the preceding examples,

the EIOp in (64b) chooses only one proposition among the contextually relevant ones (incidentally, notice that the contextually relevant set of propositions associated with (64b) does not contain (64a), but the proposition that is derived from (64a) by implicature, i.e. *Non inviteremo tutti gli studenti*, which is due to the process of focus interpretation interacting with the computation of scalar implicatures. The investigation of this phenomenon is outside the purposes of this paper).

(64) a. Inviteremo alcuni studenti.
We will invite some of the students.
b. No, **TUTTI GLI STUDENTI** inviteremo.
No, it is **ALL OF THE STUDENTS** that we will invite.
Contextually relevant set of propositions:
{we will not invite all the students; we will invite all the students}

I leave to the reader the task of applying the same reasoning to the sentence (65b), in which the CF is expressed by an existential quantifier.

(65) a. Inviteremo tutti gli studenti.
We will invite all of the students.
b. No. **QUALCHE STUDENTE** inviteremo.
No, it is **SOME OF THE STUDENTS** that we will invite.
Contextually relevant set of propositions:
{we will invite some of the students; we will invite all the students}

Likewise, the theory predicts the difference between Hungarian and Italian in allowing for *also-phrases* that express CFs. In Hungarian, it is the DP *also-XP* that enters in the scope of the exhaustivity operator. Since the semantics of exhaustivity is incompatible with that of *also*, the structure crashes. However, the same does not happen if the EIOp takes scope over propositions (as in the case of (64b), the proposition that is denied by (66b) is derived by implicature from (66a), as indicated by (66b)).

(66) a. Maria ha comprato la sciarpa.
Maria bought the scarf.
b. **ANCHE IL CAPPELLO** ha comprato Maria.
No, it is **ALSO THE HAT** that Mary bought.
Contextually relevant set of propositions:
{Mary bought only the scarf; Mary bought also the hat}

Finally, let me consider the contrast between Hungarian and Italian when taking into account the scope phenomena associated with the EIOp. As for Hungarian, the two different scopal configurations (i.e. exhaustivity over universal quantification and vice versa) are due to the possibility of universal quantifiers to c-command the exhaustivity operator (or, alternatively, to be c-commanded by it). This possibility is not available for Italian, since the EIOp takes scope over the whole sentence. However, I expect the situation to change when considering the interaction between

the EIOp and another clausal operator. (67) and (68) verifies this hypothesis making use of the modal operator of possibility. The prediction is actually borne out, as is indicated in parentheses.[8]

(67) È possibile che Maria ci regali **IL LIBRO** (non il diario).
It is possible that it is **THE BOOK** that Maria gives to us – not the diary.
(POSSIBILITY > EXHAUSTIVITY: the proposition is true if there is at least one possible world in which Maria gives us a book instead of a diary)

(68) **IL LIBRO** è possibile che Maria ci regali (non il diario).
It is **THE BOOK** that it is possible that Maria gives to us – not the diary.
(EXHAUSTIVITY > POSSIBILITY: the proposition is true if the property of possibly being given to us by Maria holds for the book and not for the diary)

Up to now, all the differences between Hungarian and Italian have been explained within the framework of the hypothesis on the different nature of the EIOp in both languages. There is a last phenomenon to account for. Analyzing (19) and (20), I noticed that Hungarian CFs can answer *wh*-questions, while this is not the case of Italian. However, this does not follow from my assumptions. According to my theory, the answer in (69b) requires an EIOp to choose the proposition *I invited Luca* among a set of contextually relevant propositions. There is no constraint that prevents the set of propositions denoted by the answer in (69a) to be the domain of the EIOp and, consequently, the inappropriateness of (69b) would turn out to be unexplained.

(69) a. Chi hai invitato?
Who did you invite?
b. * **LUCA** ho invitato.
It was **LUCA** that I invited.

I propose to account for this datum resorting to an "economy-like" principle that prefers an IF to a CF when the results are indistinguishable. In both cases, the propositions are computed against a set of relevant alternatives. However, the exhaustivity associated with the IF can be easily derived by implicature, while the exhaustivity expressed by CF is the result of the additional semantic operation of exclusion by identification. Obviously, the verification of this hypothesis requires too much conceptual and empirical arguments for this paper to accommodate. Therefore, I prefer to leave the issue open for further investigation.

I just notice, incidentally, that some contexts allow to answer a *wh*-question by using a CF in the answer, as (70) shows. The answer (70b) is acceptable in contexts in which A expects B to have bought something unusual. The function of the CF in the answer is both to assign a value to the variable in the open-formula *I bought x* and to negate all the propositions asserting that the speaker bought something unusual.

[8]Denis Paperno pointed out to me that (67) and (68) suggest that scope is determined by surface position both in Italian and in Hungarian. In effect, this generalization seems to hold for Italian: speakers tend to consider the scope configuration determined by the linear order as the 'default' one. The same is likely to happen in Hungarian, as far as I can judge from the data analyzed by Kiss and Horvath.

(70) a. Che cosa hai comprato?
What did you buy?
b. **IL PANE** ho comprato.
It was **THE BREAD** that I bought.

If an IF was used in this case, the exhaustivity derived by implicature from the use of an IF would not have been able to perform the function of excluding contextually relevant alternatives (i.e. the set of propositions of the type *I bought x*, where x refers to something unusual). In effect, I have shown at large that the linguistic function of 'exclusion by identification' is associated only with the use of CFs.

These types of configurations have been referred to in the literature either as Emphatic Frontic or as Verum Foci (see Zubizarreta, 1998). Here, I suggest that they are instances of CFs and, accordingly, I reduce the number of specifications which have been ascribed to the label "focus" throughout the literature (see however Leonetti and Escandell-Vidal, 2009 for a different view on the issue).

6 Closing remarks

In this paper, I presented two main hypotheses on the nature of IFs and CFs, according to the most relevant literature on the issue. The first hypothesis stems from the analysis of Hungarian data and claims that IFs and CFs are represented as two completely different grammatical notions at LF. On the contrary, the second hypothesis maintains that they are just two labels for the same semantic representation. While discussing the data, I decided to pursue a third hypothesis, according to which CFs are a subtype of IFs. More precisely, CFs are IFs which are specified for exhaustivity. If this hypothesis is on the right track, it will be appropriate to introduce a terminological modification in the inventory of categories relevant in the domain of information structure: CFs should be referred to as Exhaustive foci. It has been shown that my theory is able to account for all the interpretive differences between the two informational notions, at least in Italian. Moreover, from the assumption that exhaustivity is involved in the derivation of CFs it follows that Italian and Hungarian are less different than it appears at first glance. In particular, all the differences between Italian and Hungarian CFs are reduced to the parametric variation in the type of objects over which the EIOp takes scope, which yields a significant gain in elegance.

The next step will be to extend the proposed analysis to other languages. If the theory elaborated in this paper is correct, the semantic distinction between IFs and CFs might hold cross-linguistically and, furthermore, the semantic representation associated with the latter might involve the intervention of an exhaustivity operator. Moreover, any potential cross-linguistic variation in the semantic interpretation of CFs might be explained by resorting to constraints operating on the domain of quantifications that enter in the scope of the EIOp.

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