A Structural Account of Conservativity

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Abstract: This paper explores an account of conservativity based on copy theory of movement, based on suggestions in Chierchia (1995), Fox (2002), Ludlow (2002) and Sportiche (2005). In this approach, conservativity is not a constraint on the lexicon, but rather just a by-product of the syntax-semantics interface. The reason for the (apparent) absence of non-conservative determiners from natural languages is that in entering chain relations in the syntax, they would lead to quantificational clauses truth-conditionally equivalent to ones created by regular conservative determiners. When these clauses have non-trivial meanings (i.e., non-contradictory and non-tautological), then the relevant non-conservative determiner's meaning might very well exist, but we cannot be sure as we could obtain the same sentence meaning with some conservative function instead. In other cases, the clauses created would have trivial meanings, and this would be the reason for their absence (Gajewski 2002). I then discuss three problems for this idea: (i) DPs in subject position, (ii) late merge and (iii) raising constructions (Hallman 2012). In response, I propose that (1) DPs always move and (2) every movement operation triggers a triviality check. I will then show that with these assumptions one can account for all of the three challenges above.

Keywords: syntax, semantics, generalized quantifier theory, conservativity, conservativity universal, copy theory of movement

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1. Introduction

A standard way of thinking about the meaning of natural language determiners is as functions from sets to generalized quantifiers, type $\langle\langle e,t\rangle,\langle et,t\rangle\rangle$. Given the enormous number of logically possible functions of this type (see discussion and proof in Keenan and Stavi 1986), one of the aims in the semantics literature, since the introduction of Generalized Quantifier Theory in linguistics, has been defining precisely the range and the properties of those functions that can serve as possible semantic denotations for determiner expressions (Barwise and Cooper 1981; Higginbotham and May 1981; Van Benthem 1983; Keenan and Stavi 1986; among many others).[1] Among the properties individuated, 'Conservativity' is probably the most famous. Conservativity is a property of functions defined as follows: a function *f* is conservative if and only if the equivalence in (1) holds:

(1) **Conservativity** = A function *f* is *conservative* iff for all *A*, *B:*
$f(A)(B) = f(A)(A \cap B)$

Sometimes, this property is illustrated by an informal natural language version of the equivalence in (1), given in (2a) and (2b).

(2) a. Every elephant is grey = Every elephant is a grey elephant.
b. Most linguists are friendly = Most linguists are friendly linguists.

The observation that all English determiners exhibit this property has led Keenan and Stavi (1986) to the conjecture of the universal in (3).[2]

(3) **Conservativity Universal**: Extensional determiners in all languages are always interpreted by *conservative* functions.

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[1] For Generalized Quantifier Theory, see Mostowski (1957) and Lindstroem (1966).

[2] Barwise and Cooper (1981) have instead two stronger universals that entail this:

(i) **NP-Quantifier Universal**: Every natural language has syntactic constituents (called noun- phrases) whose semantic function is to express generalized quantifiers over the domain of discourse.

(ii) **Determiner Universal**: Every natural language contains basic expressions, (called determiners) whose semantic functions to assign to common count noun denotations (i.e., sets) A *a quantifier that lives on A* (Barwise and Cooper 1981:177).

(See von Fintel and Matthewson (2008) for discussion of these two universals.)

(3) is a robust and accepted generalization, which has persisted through the years, despite putative counterexamples.[3] To my knowledge, conservativity still does not have a satisfactory and complete explanation, though there are suggestions on how to derive it in the literature, to which I will not be able to do full justice here. Rather, in the following, I will instead explore an approach to conservitivity based on the syntax-semantics interface. In this approach, there is no direct ban on the denotation of determiners like (3) above. Rather, determiners are in principle free to denote conservative or non-conservative functions. I will show, however, that in the latter case, given the way syntax and semantics interact, the meanings they give rise to are indistinguishable from the meanings one would obtain by corresponding conservative functions. Therefore, I argue, these non-conservative denotations of determiners might very well exist, but we cannot be sure as the resulting sentence meaning we observe could also be obtained by using some corresponding conservative determiner meaning instead. Moreover, I discuss the situation in which the sentence meaning these hypothetical non-conservative determiners would give rise to is trivial (i.e. contradictory or tautological). In this case, we can be sure these determiner meanings do not exist, precisely because they would lead to trivial meanings. In fact, this case is what lead Chierchia (1995), Fox (2002) and Sportiche (2005) to the proposal that there aren't non-conservative determiners precisely because they would always lead to trivial meanings.[4] In this paper, I show that this original idea is not able to account for cases of hypothetical non-conservative determiners, which do not lead to trivial sentence meanings and I will formulate a different proposal in terms of the equivalence mentioned above between sentence meanings involving hypothetical non-conservative determiners and those involving conservative ones. The intuition by Chierchia (1995), Fox (2002) and Sportiche (2005) will play a role in an indirect way, however, for those cases in which a hypothetical non-conservative determiner would lead to a sentence meaning that is trivial.

The contribution of this paper is twofold: first, I show that the initial formulations of the structural account of conservativity (Chierchia 1995; Fox 2002; Sportiche 2005) are not sufficient, in that they are unable to cover the case of potential

[3] See Ahn and Sauerland (forthcoming) for a recent interesting case with proportional quantifiers in German and Korean.

[4] Here "triviality" is used as a general term including both contradictions and tautologies. In section 6 below, I will introduce the more stringent notion of Logical-triviality, by Gajewski (2002). Notice that Fox (2002) does not talk about 'trivial' meanings, because he uses a theory of chains in which copies are transformed in presuppositional elements and therefore the relevant corresponding notion is that of systematic 'presupposition failure.' As far as I can see, nothing changes if we adopt his system for our purposes here. See also footnote 27.

non-conservative meanings of determiners, which lead to non-trivial meanings for the quantificational clause they are in. Then, I show how a modified version of this approach can handle this case too. Finally, I discuss three problems for the structural hypothesis and I propose a solution for each. In particular, the paper is organized as follows: in the rest of the introduction, I will outline the proposal in brief and discuss some general motivations for a structural approach to conservativity. In section 2, I will outline the basic hypothesis. In section 3, I will discuss the case of non-conservative meanings for determiners, which do not lead to triviality. This latter case is the reason for modifying the original basic hypothesis. In section 4, I will discuss three problems for the basic hypothesis, having to do with DPs in subject position, late merge of adjuncts, and the case of raising constructions observed by Hallman (2012). In section 5, I will propose to supplement the basic idea with the assumptions that DPs always move from a VP-internal position and that every movement triggers a triviality check and show how these assumptions allow us to solve the three problems above. Finally, in section 6, I will explore some notions of triviality that one could assume in conjunction with the account of conservativity proposed in this paper. In section 7, I will conclude the paper.

Before moving on to discussing some initial motivations for a structural approach to conservativity, let me state more precisely the generalization related to conservativity to be accounted for, in relation to the assumptions we will be making about the way determiners compose with their arguments, and the proposal that I will put forward in the paper below.[5]

1.1. The Generalization and the Proposal in a Nutshell

Notice that (3) is a generalization about the possible denotations of determiners. There is, however, a related generalization about sentence meanings involving determiners, which we could formulate as in (4).

(4) **Conservativity Universal (sentence level):** In all languages, every sentence involving an extensional determiner of the form "D NP VP" is always equivalent to a sentence of the form "D NP is an NP that VP".

Under the assumption that a sentence of the form "D NP VP" is simply interpreted as [[D]]([[NP]])([[VP]]), the generalization in (4) is straightforwardly related to the one in (3). In the structural approach explored here, however, we make different assumptions about the way a sentence of the form "D NP VP" is composed. In essence,

[5] Thanks to an anonymous reviewer for this extremely helpful discussion here.

given the interaction between syntax and semantics we assume, sentences like those are composed as [[D]]([[NP]])([[VP]] ∩ [[NP]]) (where the first argument of the "D" is also interpreted in the second argument) .As a consequence, the two generalizations in (3) and (4) are not related anymore in a straightforward way and the one we should be aiming to account for is (4) rather than (3).

In the following, I will first discuss the hypothesis by Chierchia and Fox to account for (4) as in (5).

(5) **Chierchia-Fox hypothesis**: If the meaning of a sentence of the form "D NP VP" is computed via the recipe [[D]] ([[NP]])([[VP]] ∩ [[NP]]) then whenever [[D]] is a non-conservative function such a sentence will always have a trivial meaning.

Then, I will show that (5) is not sufficient to account for (4). This is because it is simply not true that all sentence meanings created in that way given some non-conservative [[D]] are trivial. I will therefore propose instead to replace (5) with (6).

(6) **Structural Conservativity**: If the meaning of a sentence of the form "D NP VP" is computed via the recipe [[D]]([[NP]])([[VP]] ∩ [[NP]]), then whenever [[D]] is a non-conservative function such a sentence will always be equivalent to *f*([[NP]])([[VP]])for some function *f* that is conservative.

Notice that (6) doesn't make reference to triviality. Triviality, however, still plays an indirect role - in a way vindicating the original intuition of the Chierchia-Fox hypothesis. This is because in those cases in which the sentence meanings created would be trivial, assuming triviality is blocked, we can be sure that those hypothetical non-conservative determiners do not exist. In addition, (6) will also allow us to explain those cases in which the sentence meanings created are instead not trivial.

1.2. Motivating the Structural Route to Conservativity

In this section, I discuss how the link between conservativity and the syntactic category of determiners strongly suggests that an account of conservativity in which syntax plays a prominent role should be pursued.

1.2.1. Processing and Semantic Approaches to Conservativity

To my knowledge, a full-fledged pragmatic/processing account has not been proposed, but one might hope that a simple principle like (7) could account for conservativity.

(7) In quantificational statements, consider only the members of the denotation of the first argument of the quantifier.[6]

A different approach is to encode the constraint in the semantics. Keenan and Stavi (1986) have proven that conservative determiners are exactly the ones obtained by closing a small class of initial determiners under boolean operations (see also Van Benthem 1983 for a similar proof). The *Conservativity Theorem*, as they call it, shows that the set of determiners generated from the relations of *every* (inclusion: $D\ (A)\ (B) = A \subseteq B$) and the one of *some* (overlap: $D\ (A)\ (B) = A \cap B \neq \varnothing$) using boolean compounds and adjectival restrictions, coincides with the one of conservative determiners. From their result they speculate that it could be the reason for the existence of conservativity itself:

> our definition of D_{Det} [*determiners*] together with the CT [conservativity theorem] gives a reason why the possible det denotations of English are just the conservative functions. Namely, that fact follows from the fact that D_{Det} must be closed under the boolean operations and contain certain simple functions we need to interpret simple dets (Keenan and Stavi 1986:291).

So conservativity would follow from the fact that conservative functions are the only denotations that we can generate given the basic ingredients that we have.

1.2.2. Conservativity and Determinerhood

Notice that in both approaches above, no connection is predicted between the possible denotations of determiners, what they call *determiners*, and actual determiner expressions. That is to say, there is nothing in the processing/pragmatic or semantic approach that link the conservativity constraint on functions from sets to generalized quantifiers to the syntactic category of determiners. In other words, one prediction of both accounts above is that conservativity should be a general constraint on quantification and that there should not exist non-conservative functions in the lexicon regardless of the syntactic category to which they would be mapped. In other words, it is not expected that a processing or a general semantic constraint should be able to discriminate between syntactic categories. I think this is the main motivation for exploring a more structural account of conservativity, in which the syntax plays a crucial role together with the semantics.

In relation to the connection between conservativity and determinerhood the case of *only* is interesting. I will not be able to explore the semantics of *only* in the context of

[6] Here 'first' needs to be understood in terms of what argument is encountered first in the bottom-up semantic composition, rather than on linear order. For a suggestion along these lines, see Chierchia (2009), who uses this notion of 'coming first in the semantic composition' to account for data regarding presupposition projection. Thanks to an anonymous reviewer for discussion on this point.

the copy theory of movement in any detail, but one simple possible approach would be to analyze it as a non-conservative function:[7]

(8) [[Only]] = $\lambda P \lambda Q[P \supseteq Q]$

To see that (8) is not conservative consider the non-equivalence in (9).

(9) Only students smoke. ≠ only students are students who smoke.

The left hand-side is contingent, while the right hand-side is tautological. So *only* is a potential counterexample to conservativity and the usual response is to claim that *only* is not a determiner hence conservativity would not apply. But this means precisely considering conservativity not as a constraint on quantification in general but as quantification mapped to the syntactic category of determiners. However, then, as mentioned above, it is not clear why a processing-based account should distinguish between quantificational elements that belong to different syntactic categories: why adverbial quantification would be allowed to be less efficient from a processing point of view than determiner quantification? Similarly, why a general semantic constraint should distinguish between a quantifier mapped to the category of determiners and one mapped to the one of adverbs? As Hackl (2000:29) puts it:

> Since it [only] is an adverbial quantifier that is non-conservative, the conservativity universal seems to be (primarily) a property of determiner quantifiers and not a property of quantification in natural language *per se*. This prompts immediately the question why only determiner quantifiers are universally conservative and suggests to look for an answer in terms of the syntactic properties of determiner quantifiers.

Another example is the (English) comparative morpheme −*er*, which has been analyzed as a quantifier over degrees. Both the variant with larger cardinality and the one with proper subset are non-conservative.[8]

(10) [[er]] =

a. $\lambda P_{\langle d,t\rangle} \lambda Q_{\langle d,t\rangle}[max(Q) > max(P)]$

b. $\lambda P_{\langle d,t\rangle} \lambda Q_{\langle d,t\rangle}[P \subset Q]$

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[7] Where P would correspond to the restrictor and Q to the scope (e.g., in the case of *only2*, *students* and *smoke* respectively). For a treatment of *only* within the copy theory of movement, see Erlewine (2014).

[8] See Beck (2011) for a summary and references and Bhatt and Pancheva (2004) for an analysis that crucially involves the non-conservativity of −*er*.

Again this would be a case of a non-conservative quantifier mapped to a category that is not the one of determiners. Evidently, both these cases depend on the semantics one adopts for *only* and for the comparative morpheme, but if we want to allow the possibility of these kinds of analyses, then a pragmatic or a purely semantic route to conservativity does not seem to be the right choice. So, I think, then, it is worth exploring a more structural account, which encodes conservativity not in the lexicon but more in the syntax/semantics interface and which can account for the connection of conservativity to determiner-quantification.

2. The Basic Idea

In the structural account of conservativity that I will propose here, conservativity is not a direct constraint on the lexicon, rather it is a by-product of the syntax/semantics interface. This approach is suggested in Chierchia (1995), Fox (2002), Ludlow (2002) and Sportiche (2005) and it is based on the assumption that there are contentful traces in the syntax.[9] The gist of the idea is in (11), repeated from above:

(11) **Chierchia-Fox hypothesis**: If the meaning of a sentence of the form "D NP VP" is computed via the recipe [[D]]([[NP]])([[VP]] ∩ [[NP]]) then whenever [[D]] is a non-conservative function such a sentence will always have a trivial meaning.

Below I will discuss how this basic hypothesis will need to be modified. But first I turn to discuss some assumptions on the semantics of chains.

2.1. Some Assumptions on the Interpretation of Chains

In the following, I will assume a syntax-semantics mapping that is based on a level of syntactic structure (Logical Form) interpreted by the semantic component where the scope of quantifiers can be determined by movement operations (see Heim and Kratzer 1998, Jacobson 2002 and Fox 2003 for discussions of the arguments and comparison with alternative approaches). I will also crucially assume the copy theory of movement (Chomsky 1993, 1995) in which movement transformations are conceptualized just as a copying operation followed by phonological deletion. Copy theory has the advantages

[9] Ludlow (2002) proposes a syntactic version of Keenan and Stavi's (1986) idea that determiners are composed (in the syntax) as simple determiners and boolean operations. This is not a feature of the proposal I am defending in this paper and it potentially leads to very different predictions. I leave a detailed comparison with Ludlow's (2002) idea for future work.

of eliminating traces and making movement a simpler operation, as Fox (2003:44) remarks:

> Chomsky (1995) points out that the copy theory of movement simplifies syntax in two ways. First, the theory eliminates the need to postulate new objects (traces) beyond run-of-the-mill lexical items. In this sense, it brings us closer to a view of syntax as a recursive procedure that does not access anything but the lexicon. Second, the copy theory turns movement into a simpler operation; it is practically identical to the elementary structure-building operation (merge), differing only in that it takes as input an object that has served as input for an earlier merger (move is re-merge).

More importantly for us here, it opens new perspectives on how chains should be interpreted. Once one assumes copy theory of movement, hence having constructions such as (12) one must entertain some mechanism for altering lower copies to make them interpretable with the rules above.

(12) $[_{DP}$ Every movie] [1 $[_{TP}$ Polanski $[_{VP}$ likes $[_{DP}$ ⟨every movie⟩$_1$]]]]

In a framework with traces it was natural to interpret the trace of the moved item as a bare variable (Heim and Kratzer 1998) and one could also stipulate that this is what happens to copies too, but there are more interesting options and this is what we will exploit here.

For the sake of the discussion, I will make some simplifications concerning the semantics of chains, but nothing hinges on these assumptions. The proposal here is compatible with a class of semantics of chains, as long as somehow the NP part of the copies is interpreted at the tail and at the head of the chain (see Sauerland 1998; Fox 2002; Sportiche 2005; among many others).

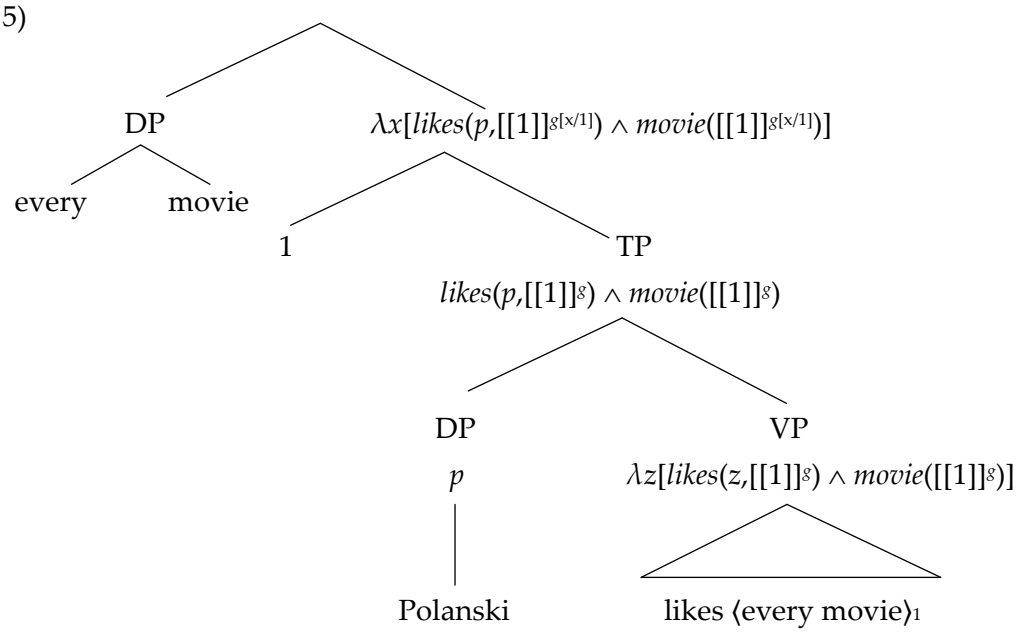
For a sentence like (13), I will not go into the internal composition of the VP and I will just assume the meaning for the entire VP as in (14), which then composes with the moved DPs as in (15).[10]

(13) Polanski likes every movie.

[10] One way to think about this is to have the copy of the first argument of the quantifier and the verb combining in such a way that the former 'restricts' the latter (Chung and Ladusaw 2004). In this way, $\lambda y \lambda x[likes(x,y)]$ and $\lambda v[movie(v)]$ would become $\lambda y \lambda x[likes(x,y) \wedge movie(y)]$. Then, one could assume that the result combines with the individual assigned to the index, which is later abstracted on, thereby becoming $\lambda x[likes(x, g(1)) \wedge movie(g(1))]$. For similar composition mode, see Geenhoven 2002. Again, none of the points below hinges on any of these particular assumptions about the semantics of chains.

(14) $[[\text{likes } \langle\text{every movie}\rangle]]^g = \lambda z[likes(z,[[1]]^g) \wedge movie([[1]]^g)]$

(15)



The meaning of the whole sentence could be paraphrased as something like 'everything that is a movie is liked by Polanski and it is a movie.' Which we can represent in predicate logic or in set notation as in (16a) and (16b) respectively.

(16) a. $\forall x[movie(x) \rightarrow (likes(p,x) \wedge movie(x))]$

b. $\{x : x \textit{ is a movie}\} \subseteq \{\{y : y \textit{ is liked by Polanski}\} \cap \{z : z \textit{ is a movie}\}\}$

2.2. Predictions for Non-Conservative Determiners

The Chierchia-Fox hypothesis is that if non-conservative determiners existed, in entering chain relations, they would lead to trivial meanings. In order to test this hypothesis, consider some made-up non-conservative determiners defined on the complement of the restrictors, let us call them *everynon*, *somenon* and *nonon*, the denotations of which are given in (17), (18) and (19).[11, 12]

[11] The former is used in Chierchia and McConnell-Ginet (2000), see also von Fintel (1994). Notice that these are not those cases of lexicalization gaps of the 'south east corner' of the square of oppositions for connectives and quantifiers as observed in Horn (1972) and Horn (1989). The case of the universal quantifier is usually called *not all* and has the definition in (i), which is perfectly conservative as shown by the equivalence in (ii):

(i) $[[\text{everynon}]] = \lambda P \lambda Q\, \neg\forall x[P(x) \rightarrow Q(x)] =$

$\lambda P \lambda Q[\{P \cap \bar{Q}\} \neq \varnothing]$

(17) [[everynon]] = $\lambda P \lambda Q[P^{\neg} \subseteq Q]$ =

$\lambda P \lambda Q \forall x[\neg P(x) \rightarrow Q(x)]$

$= \lambda P \lambda Q \forall x[P(x) \vee Q(x)]$

(18) [[somenon]] = $\lambda P \lambda Q[(P^{\neg} \cap Q) \neq \varnothing]$ =
$\lambda P \lambda Q \exists x[\neg P(x) \wedge Q(x)]$

(19) [[nonon]] = $\lambda P \lambda Q[(P^{\neg} \cap Q) = \varnothing]$ =
$\lambda P \lambda Q \neg \exists x[\neg P(x) \wedge Q(x)]$

To illustrate these possible determiners at work, consider a sentence like (20) and a possible LF of it in (21), where the DP [everynon movie] has moved from its object position.

(20) Polanski likes everynon movie.

(21) [everynon movie] [λ_i [Polanski [likes ⟨everynon movie⟩]$_i$]]]

As is evident from the informal paraphrases given below, if we apply these meanings to the sentence above, the result is contradictory. The same result is obtained if we replace *everynon* with *somenon*. We obtain a tautological meaning if we replace it with *nonon*, as shown in (24a).

(22) a. $\forall x[\neg movie(x) \rightarrow (likes(p,x) \wedge movie(x))]$

b. $\{x : x \textit{ is not a movie}\} \subseteq \{\{y : \textit{polanski likes } y\} \cap \{z : z \textit{ is a movie}\}\}$

c. For everything x that is not a movie, Polanski like x and x is a movie.

(ii) $\{P \cap Q^{\neg}\} = \varnothing = P \cap \{P \cap Q^{\neg}\} = \varnothing$

For an explanation based on the notion of generalized scalar implicatures and markedness of negation see Horn's work cited above (see also Levinson 2000). For a recent different interesting proposal within a system where logical operators are based on min and max operators see Katzir and Singh (2013). It is not clear to me whether there is a relation between the absence of lexicalization of operators of this sort and non-conservative ones and I will leave this topic for future research.

[12] For any set A, $A^{\neg}$ is the complement of A, that is the domain $D - A$. Also, whenever possible I will give the meaning of quantifiers in predicate logic.

(23) a. $\exists x\ [\neg movie(x) \wedge (likes(p,x) \wedge movie(x))]$

b. $\{x : x \textit{ is not a movie}\} \cap \{\{y : \textit{Polanski likes } y\} \cap \{z : z \textit{ is a movie}\}\} \neq \varnothing$

c. There exists an x that is not a movie and Polanski likes x and x is a movie.

(24) a. $\neg\exists x\ [\neg movie(x) \wedge (likes\ (p,x) \wedge movie(x))]$

b. $\{x : x \textit{ is not a movie}\} \cap \{\{y : \textit{Polanski likes } y\} \cap \{z : z \textit{ is a movie}\}\} = \varnothing$

c. It is not the case that there exists an x that is not a movie and Polanski likes and x is a movie.

As we will see a similar result is obtained also for other made-up non-conservative determiners. From now on, I will use a more schematic way to present the relevant cases. First, let us define a symbol $\star$, which given a function f and its arguments (A, B) has the following effect.[13]

(25) $f \star (A,B) = f\,(A, A \cap B)$

Abstractly, the relationship between the syntax and the semantics of chain is as follows: the syntax creates a structure in which the (internal argument of the) determiner phrase has a copy in the second argument of the determiner. In the semantics, the effect of this syntactic operation is that the first argument of the quantifier is also interpreted within its second argument. In turn, this leads to the effect that if the determiner had as lexical denotation a non-conservative function, the resulting sentence would wind up with a trivial meaning.[14] For instance, *everynon* would be presented as in (26), where in (26a) there is the lexical meaning of the determiner and in (26b) the output given the syntax-semantics assumed here.

(26) a. [[everynon]] = $\lambda P \lambda Q[P^{-} \subseteq Q]$

b. [[everynon]] $\star$ $(A, B) = A^{-} \subseteq (A \cap B)$

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[13] Contrast this operation with the more commonly used operation of semantic composition, which we could call \$ and that works as in (i). Thanks to an anonymous reviewer for suggesting this notation to me.

(i) $f\,\$\,(A,B) = f\,(A,B)$

[14] Thanks to an anonymous reviewer for discussion on this point. See below for a refinement of this point: the resulting sentence is not always trivial, but it could also be equivalent to a sentence one can also obtain by assuming a conservative function as the lexical meaning of the relevant determiner.

Similar cases of possible non-conservative determiners include the proper subset relation, which is non-conservative and which here would lead to quantificational clauses that are always false.

(27) a. [[propsub]] = $\lambda P \lambda Q\ [P \subset Q]$

b. [[propsub]] $\star$ $(A,B) = A \subset (A \cap B)$

Also the (non-conservative) superset or equal relation leads to a trivial (always true) meaning.[15]

(28) a. [[superseteq]] = $\lambda P \lambda Q [P \supseteq Q]$

b. [[superseteq]] $\star$ $(A,B) = A \supseteq (A \cap B)$

Summing up, what we have seen so far are cases of possible non-conservative denotations of determiners, which create trivial meanings if put in a chain with copies. Chierchia-Fox hypothesis is that this is precisely the reason why we do not see these denotations in natural language. I turn now to the case of some possible non-conservative denotations which, surprisingly, do not lead to trivial meanings and, therefore, requires us to modify Chierchia-Fox hypothesis. I will also show that the resulting sentences are equivalent to what you would obtain if we were to assume for the lexical meaning of the relevant determiner a conservative function, instead. I will argue, therefore, that these contingent non-conservative lexical denotations for determiners might very well exist in the lexicon of certain languages and will modify Chierchia-Fox hypothesis in order to account for these cases too.

[15] Notice that, as mentioned above, *only* has been sometimes given the meaning of a non-conservative *determiner* encoding the superset or equal relation as in (i) (see De Mey 1996; among others). The case of *only* goes beyond the scope of this paper, and in the literature there are various arguments against the idea of treating it as a determiner with the analysis in (i) (see von Fintel 1999 and Ippolito 2007; among others for discussion). Here let me just point out that regardless of the analysis of *only* the superset or equal relation is a potential non-conservative determiner and it is predicted to lead to a trivial meaning given the Chierchia-Fox hypothesis:

(i) [[Only]] = $\lambda P \lambda Q [P \supseteq Q]$
$\lambda P \lambda Q \forall x [Q(x) \rightarrow P(x)]$

3. **Modifying the Basic Idea**

Recall that the prediction of the Chierchia-Fox hypothesis for non-conservative determiners is that they should always lead to triviality. So what we don't expect is to assign a non-conservative function as the denotation of a determiner and to find that the resulting sentence when it combines with its arguments A,B has a non-trivial meaning, even when its B arguments contains a copy of its A argument. But let me show you now that, in fact, we do find such cases. Consider the relation of larger cardinality, call the corresponding potential non conservative determiner 'Korgat'.[16]

(29) a. [[Korgat]] = $\lambda P \lambda Q[|P| > |Q|]$

b. [[Korgat]] $\star$ (A,B) = $|A| > |A \cap B|$

It is straightforward to show that [[Korgat]] is contingent.

i. If $A \subseteq B$ is true:

a. then $(A \cap B)$ becomes simply A hence

b. $|A|>|A \cap B|$ becomes $|A|>|A|$ which is false

ii. If $A \nsubseteq B$:

then $(A \cap B)$ is either $\varnothing$ or some non-empty proper subset of A itself.

i. in the first case $|A| > |A \cap B|$ becomes $|A| > 0$ which is true, if we assume that non-emptiness of the domain of quantification is provided independently.

ii. in the second case $|A| > |A \cap B|$ becomes true, given that in this last case $A \cap B$ can only be a subset of A.

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[16] I will give monster names to these non-conservative functions. To see that 'Korgat' is non-conservative consider the following situation: imagine $|A| = 5$ and $|B| = 10$ and that $|A \cap B| = 0$. In this situation, (ia) is false but (ib) is true:

(i) a. [[Korgat]]$(A,B) = 5 > 10$ = false

b. [[Korgat]]$(A,A \cap B) = 5 > 0$ = true

Therefore, the 'conservativity equivalence,' repeated in (ii), does not hold.

(ii) **Conservativity** $=_{def}$

A function f is *conservative* iff for all $A,B \subseteq E$

$f_E(A)(B) \Leftrightarrow f_E(A)(A \cap B)$

iii. Hence we have cases in which [[Korgat]] is true and cases in which it is false, showing that it is contingent.

Also the identity relation in (30), let us call it [[Minulzur]], gives rise to the same issue. As shown below, [[Minulzur]] is also contingent.

(30) a. [[Minulzur]] = $\lambda P \lambda Q[|P| = |Q|]$

b. [[Minulzur]] $\star$ $(A, B) = |A| = |(A \cap B)|$

i. if $A \subseteq B$ is true

a. then $(A \cap B)$ becomes simply A hence

b. $|A|=|A \cap B|$ becomes $|A|=|A|$ which is always true

ii. if $A \nsubseteq B$

a. then $(A \cap B)$ is either $\varnothing$ or some non-empty proper subset of A itself.

b. in both cases $|A| = |A \cap B|$, which is false, provided again an independent condition that prevents emptyness of the domain of quantification.

iii. So, also for [[Milnuzur]] we have contingency

Similarly, consider [Zeesnook], which relates two sets with identity directly, or [Sakalthor], which is the superset relation. As the reader can verify, they both lead to contingent meanings (the latter for instance is always true, unless $A \subseteq B$, then $A \supset (A \cap B)$ becomes $A \supset A$).

(31) a. [[Zeesnook]] = $\lambda P \lambda Q[P = Q]$

b. [[Zeesnook]] $\star$ $(A, B) = A = (A \cap B)$

(32) a. [[Sakalthor]] = $\lambda P \lambda Q\ [P \supset Q]$

b. [[Sakalthor]] $\star$ $(A, B) = A \supset (A \cap B)$

Other minor variations, lead to contingency, like [[Balkumagan]] expressing the the first set is empty or [[Glusterhap]] relating the two cardinalities of the arguments to the same number:

(33) a. [[Balkumagan]] = $\lambda P \lambda Q[P \cup Q = Q]$

b. [[Balkumagan]] $\star$ $(A,B) = A \cup (A \cap B) = (A \cap B)$

A = $(A \cap B)$

(34) a. [[Glusterhap]] = $\lambda P \lambda Q\ [|P| = 3 \wedge |Q| = 3$

b. [[Glusterhap]] $\star$ $(A,B) = |A| = 3 \wedge |(A \cap B)| = 3$

Summing up, the cases we have just seen are all cases of potential lexical denotations of determiner expressions that are non-conservative but that do not lead to sentences with trivial meanings. These cases are therefore problematic for the Chierchia-Fox hypothesis.

If we look at the meanings above, however, it turns out that the truth-conditions of all of them correspond to the ones that conservative lexical denotations of determiners give rise to. In particular, the cases considered either correspond to the meaning of sentences created by *every* or *not every* or expressions like *the three*. Where *every* is defined as in (35), *not every* as in (36) and a numeral like *the three* is defined as in (37) (Keenan 1996; among others).

(35) [[every]] = $\lambda P \lambda Q[P \subseteq Q]$

(36) [[not every]] = $\lambda P \lambda Q[P \nsubseteq Q]$

(37) [[the three]] = $\lambda P \lambda Q[P \subseteq Q \wedge |P \cap Q| = 3]$

For instance, [[korgat]], once fed the appropriate argument, is equivalent to *not every*: always true, unless $A \subseteq B$, as in (38). Similarly, [[Minulzur]](A,B) is only true when $(A \cap B) = A$ and this is so when $A \subseteq B$. Therefore, it is equivalent to *every*. The same goes for Zeesnook, Sakalthor and Balkumagan.

(38) [[korgat]] $\star$ $(A,B) = |A| > |A \cap B| =$
$(A \nsubseteq B)$

(39) [[Minulzur]] $\star$ $(A,B) = |A| = |(A \cap B)|$
$(A \subseteq B)$

(40) [[Zeesnook]] $\star$ $(A,B) = A = (A \cap B) =$
$A \subseteq B$

(41) [[Sakalthor]] $\star$ $(A,B) = A \supset (A \cap B) =$
$(A \nsubseteq B)$

(42) [[Balkumagan]] $\star$ $(A,B) = A \cup (A \cap B) = (A \cap B)$
$A = (A \cap B) = (A \subseteq B)$

As for the case of the identity related to a number, it ends up being identical to the meaning of an expression like *the three*, defined above.

(43) [[Glusterhap]] $\star$ $(A,B) = |A| = 3 \wedge |(A \cap B)| = 3$
$(A \subseteq B \wedge |A|=3)$

The idea, therefore, is that these non-conservative determiner meanings above should not be excluded after all. In fact, as far as we can tell, they could just be the meaning of *every* or *not every* or of numeral determiners like *the three*. In other words we could not distinguish them from the meaning generally assumed for *every*, (i.e. $\lambda P \lambda Q[P \subseteq Q]$) and that we could assign to *not every* (i.e. $\lambda P \lambda Q[P \nsubseteq Q]$).[17]

Summing up, we have seen that the Chierchia-Fox hypothesis is challenged by the case of contingent sentences containing non-conservative determiners. However, we have also seen that these contingent meanings can also be obtained by using regular conservative determiners. Therefore, we cannot exclude in this case that these non-conservative determiners exist. In other words, I propose to reformulate Chierchia-Fox hypothesis as in (44). It is not the case that if non-conservative determiners existed, they would always lead to triviality but rather if non-conservative determiners existed, they would either lead to triviality or to meanings that are equivalent to the ones obtained by some conservative determiners.[18]

(44) **Structural Conservativity (first version):** If the meaning of a sentence of the form "D NP VP" is computed via the recipe [[D]]([[NP]])([[VP]] $\cap$ [[NP]]), then whenever [[D]] is a non-conservative function such a sentence will either be trivial or equivalent to *f* ([[NP]])([[VP]]) for some function *f* that is conservative.

As an anonymous reviewer suggested to me, we could even simplify (44) as in (45). This is because, even for the cases above of non-conservative functions leading to a trivial meaning, we can always find a corresponding conservative function that would lead to such a meaning.

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[17] Notice that *not every* is assumed not to be lexicalized in any language, see Horn (1989), Katzir and Singh (2013) and footnote 11 above.

[18] Thanks to Rick Nouwen (pers. comm.) for suggesting to me this way of looking at the issue here.

(45) **Structural Conservativity (second version):** If the meaning of a sentence of the form "D NP VP" is computed via the recipe [[D]]([[NP]])([[VP]] ∩ [[NP]]), then whenever [[D]] is a non-conservative function such a sentence will always be equivalent to *f*([[NP]])([[VP]]) for some function *f* that is conservative.

Consider for instance the case of *everynon* in (46a), repeated from above: once it combines with its arguments in the way seen above, it gives rise to the meaning in (46b).

(46) a. [[everynon]] = $\lambda P \lambda Q[P^{-} \subseteq Q]$

b. [[everynon]] ⋆ (A,B)=$A^{-} \subseteq (A \cap B)$

As it turns out, however, also in this case we can define a corresponding conservative determiner, call it *everynon'*, which would give rise to the same meaning in (46b), as shown in (47b). Basically, what is happening in (47) is that we are defining the function in such a way that its first argument is intersected with the second argument in the second part of the output of the function ($A \cap B$). This effectively mimics semantically what the syntax/semantics of chains assumed above does by leaving an interpreted copy at the bottom of the chain. When the two effects are combined, as in (47b), the result is equivalent to (46b). However, the difference is that *everynon'* in (47a), unlike *everynon* in (46a), is a conservative function.[19] Therefore, there is a conservative function which leads to the same result we obtain by using the non-conservative function in (48a). The recipe is very general and extends to all other cases considered above like *somenon* and *nonon*.

(47) a. [[everynon']] = $\lambda P \lambda Q[P^{-} \subseteq (P \cap Q)]$

b. [[everynon']] ⋆ $(A,B) = A^{-} \subseteq (A \cap A \cap B) =$

$A^{-} \subseteq (A \cap B)$

So what is the difference between cases like *everynon*, *somenon*, on one hand, and cases like *Minulzur*, on the other? In a sense, there is no difference: as we saw, in both cases we can find a corresponding conservative function, which leads to the same sentence meaning. This is why we can adopt the simplified version of Structural Conservativity hypothesis in (45).

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[19] To see that *everynon'* is conservative consider the equivalence in (i):

(i) [[everynon']]\$$(A, B) = A^{-} \subseteq (A \cap B) = A^{-} \subseteq (A \cap A \cap B)$ = [[everynon']]\$$(A, A \cap B)$

There is, however, also a difference between the two cases of course, which one could see as vindicating the intuition in Chierchia (1995), Fox (2002), Sportiche (2005): cases like *everynon* (and *everynon'*) lead to trivial quantificational sentences. This, I argue, is the reason why they are not possible denotations of determiners in natural language, regardless of their being conservative or not – provided triviality is blocked independently, as we will discuss below. Cases like *Minulzur* (and its corresponding conservative counterpart *every*), on the other hand, lead to contingent meanings. In this case, I argue, either of them could exist as the lexical denotation of the determiner 'every' in English (and its counterpart in other languages). I will come back in the last section on which notion of triviality we could assume in conjunction with the structural hypothesis of conservativity proposed here. In the following, I will turn to three problems for this hypothesis, arising in particular with those hypothetical determiner meanings that lead to triviliaty, and will propose a response to these problems based on two independently motivated assumptions about DPs and the syntax-semantics interface.

4. Three Problems

4.1. DPs in Subject Positions

The first problem is constituted by DPs in subject position. The problem is that in this position, DPs can be interpreted in situ, because, unlike DPs in other positions, they do not give rise to a type mismatch (Heim and Kratzer 1998). If this is the case, though, they would not create pointless or logically trivial meanings, as it is evident from the example below.

(48) a. Everynon student smokes

b. $\forall x\ [\neg student(x) \rightarrow smoke(x)]$

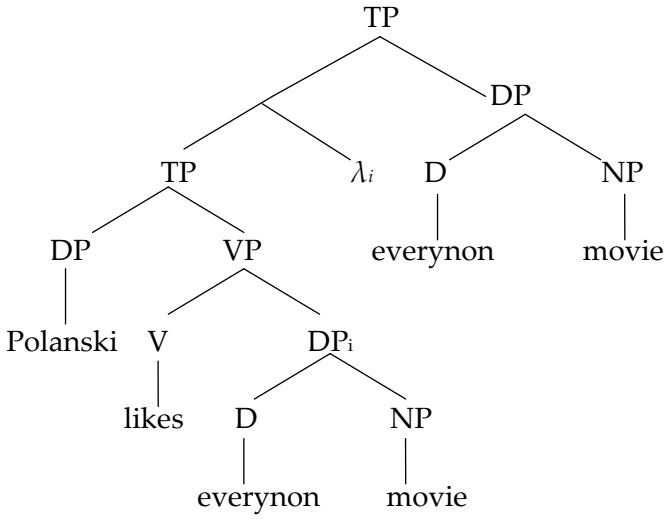
This is, of course, a consequence of the fact that the meanings of these non-conservative determiners are not trivial by themselves, but become trivial only under the particular transformation that the syntax-semantics assumed here leads to. In other words, if this transformation doesn't occur, the meanings are perfectly contingent, hence we are back to the situation in which it is not obvious why the determiner expressions encoding them should be excluded.

4.2. Late Merge and Non-Conservativity

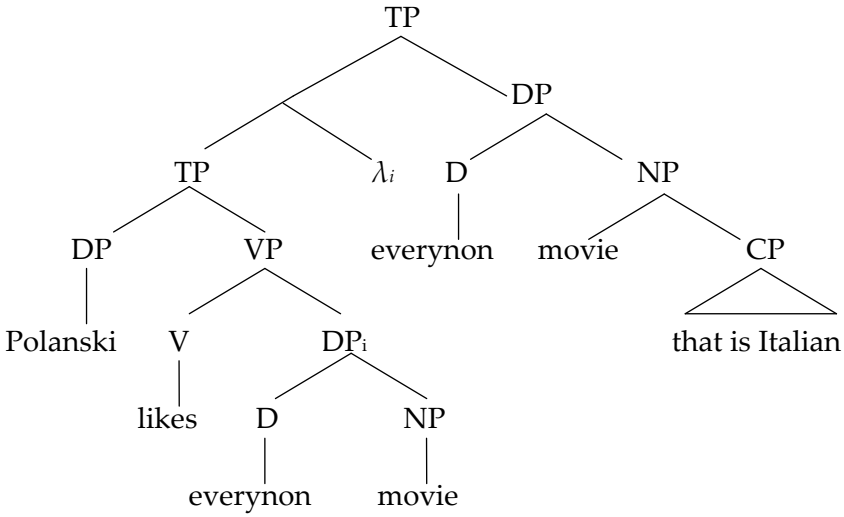
Another problematic prediction is made under some particular assumptions that allow late merge after Quantifier Raising (QR), which goes back to Lebeaux (1990) and have been used among other things in accounts of adjunct-extraposition from NP (Fox and Nissenbaum 1999) and Antecedent Contain Deletion (Fox 2002). The problem is that we could create a case like (49), where we first QR the non conservative DP *everynon movie* and then we late merge the relative clause *that is Italian*.[20]

(49) Polanski likes everynon movie that is Italian.

(50)



(51)



[20] Notice that in the tree below, I am following Fox and Nissenbaum's assumption that QR is a rightward movement, but nothing relevant for us hinges on this assumption.

If we run the semantic computation on the LF thereby created, the output turns out to be non-trivial (something that we could paraphrase as: 'for every thing that is not an Italian movie, Polanski likes it and it is a movie').

(52) $\forall x[\neg(movie(x) \wedge italian(x)) \rightarrow (likes(p,x) \wedge movie(x))]$

4.3. Raising Constructions

Hallman (2012) discusses a further interesting problematic case for the Chierchia-Fox hypothesis, coming from raising constructions involving verbs like *seem*. To illustrate the problem, consider the case in (53): here one of the non-conservative determiners that we discussed above is raised from the sentential argument of *seem*.[21]

(53) Somenon unicorn seems to be in the garden.

The problem with (53) is as follows: if we analyze (53) as in (54), the resulting meaning would be not trivial anymore. This is because the lower copy is interpreted in the scope of *seem*, while the higher one is interpreted outside. The resulting meaning would be something like (55), paraphrasable as there is some actual non-unicorn, who seems to be a unicorn in the garden; a meaning that is obviously contingent.

(54) [Somenon unicorn] λ_i seems [$\langle$somenon unicorns$\rangle_i$ to be in the garden]

(55) $\exists x\ [\neg[[\text{unicorn}]]^{w}(x) \wedge \forall w' \in \text{SEEM}_{w}\ (w')[[[\text{unicorn}]]^{w'}(x) \wedge [[\text{in-the-garden}]]^{w'}(x)]]$

Abstractly, the case noted by Hallman (2012) is one in which an operator 'sits' in between the lower and higher copies of a determiner phrase and appears to break the crucial link between the syntax of movement and the effect on the meaning of the resulting sentence. In other words, it is a counterexample to the hypothesis presented above that every time a determiner phrase is moved and a copy is left behind, the resulting structure would have a trivial meaning if the determiner was assigned a denotation corresponding to a non-conservative function.

[21] Thanks to two anonymous reviewers for bringing this problem and Hallman's (2012) paper to my attention.

5. Response

5.1. Two Assumptions

I think the three problems above teach us that we should supplement the hypothesis above with two additional assumptions, both arguably independently justifiable.

(56) a. DPs always move from a VP internal position.

b. The result of every QR movement is checked for triviality by the semantic component.

The first assumption is motivated in the literature independently. Depending on the initial position of the DP in question, the reason for its movement could be for type-mismatch (Heim and Kratzer 1998) or for the VP-internal subject hypothesis (Kratzer 1996; among many others). So even basic sentences like (57a) or (57b) would have LFs like (58a) and (58b), respectively, in which the DPs always move from within the VP.

(57) a. Somenon students smoke.

b. Polanski met somenon students.

(58) a. [somenon students] λ_i [$_V$ $_P$ ⟨somenon students⟩$_i$ smoke]

b. [somenon students] λ_i[Polanski] λ_j [$_{VP}$ ⟨Polanski⟩$_j$ met ⟨somenon students⟩$_i$]

The second assumption is in line with the literature on economy conditions on scope-shifting operations (quantifier raising or quantifier lowering) (Fox 2000; Mayr and Spector 2013; among others). The idea in that literature is that the output of every scope-shifting operation is checked by the semantic component. The relevant property checked is whether the resulting meaning after movement is weaker than (or at least different from) the meaning of the sentence without movement. I think it is very natural to assume that the semantic component would check at each of these steps also whether the resulting meaning after movement is contradictory or tautological.[22] In the next section, I go back to the three problems above and I show that they are not problems anymore given the two assumptions in (56).

[22] Thanks to Danny Fox (pers. comm) for pointing this out to me.

5.2. Back to the Problems

Consider again the problem of DPs in subject position, like (59). Above we noticed that the problem was that if the subject doesn't undergo movement, the resulting meaning would not be trivial and thus a non-conservative determiner should be allowed after all, albeit restricted to subject positions.

(59) Somenon students smoke.

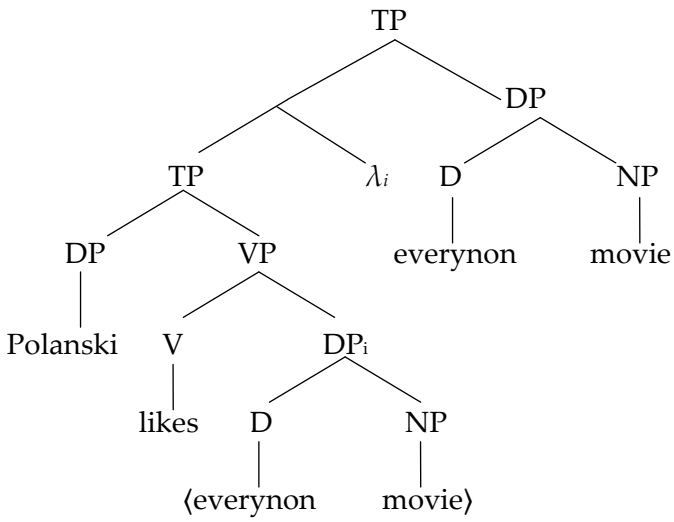
Obviously, once we assume that DPs always move from a VP-internal position, regardless of whether they are objects or subjects, we immediately solve this problem here. This is because, as seen above, a sentence like (59) would have the LF in (60), which does lead to the contradictory meaning in (61).

(60) [somenon students] [$_{VP}$ ⟨students⟩ smokes]

(61) $\exists x\ [\neg student(x) \wedge (student(x) \wedge smoke(x))]$

Going back to late merge, instead, we can see that the assumption in (56b) leads us to predict that the output of QR before late merge is checked for triviality by the semantic component. This means that the structure that is checked is (62), repeated from above, which again leads to the trivial meaning in (63).

(62)



(63) $\forall x[\neg movie(x) \rightarrow (likes(p,x) \wedge movie(x))]$

Finally, Hallman's (2012) problem with raising constructions like (64) can be solved by the combination of assumption (56a) and (56b).

(64) Somenon unicorns seems to be in the garden.

First, given assumption (56a), the LF of the sentential argument of *seem* in (64) is (65). This is after the first movement from the VP internal position, before the DP further moves out the verb *seems*. Given the assumption in (56b) that the result of every movement operation is checked by the semantic component, now (65) would be checked for triviality.[23]

(65) [somenon unicorns] to be ⟨somenon unicorns⟩ in the garden.

(65), of course, leads to the trivial meaning in (66), as we know. Therefore, sentences like (65) are not a problem anymore.[24]

(66) $\exists x\ [\neg \textit{unicorns}(x) \wedge (\textit{unicorns}(x) \wedge \textit{in-the-garden}(x))]$

In sum, once we assume that there is always an initial movement of DPs from within the VP and that every QR operation triggers a triviality check, we are able to block Hallman's problematic case at the embedded level, so to speak. Before closing, let me briefly consider an alternative solution to the raising problem, discussed by Hallman (2012) himself. The idea, following Sportiche (2005), is that copies should be interpreted with respect to the same world. This is actually the most natural assumption if we move to an approach in which predicates are interpreted with respect to world-indices in the syntax (Percus 2000; among many others). In that case, a sentence like (64) could be given the representation in (66).[25] As he discusses, this would lead to the trivial meaning in (67), as this would be saying that there is an-actual non-unicorn that for all worlds in the modal base of *seems*, it is an *actual* unicorn and is in the garden.

(67) [somenon unicorns]$_w$ seems $\lambda_{w'}$ ⟨somenon unicorns$_w$⟩ to be in the garden$_{w'}$

(68) $\exists x\ [\neg \textit{unicorn}_w(x) \wedge \forall w' \in \text{SEEM}_w(w')[\textit{unicorn}_w(x) \wedge \textit{in-the-garden}_{w'}(x)]]$

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[23] A further assumption here is that the structure is build bottom up and some movement operations can happen before the whole sentence is constructed.

[24] Hallman (2012) discusses a similar solution to the one proposed here, but says that he knows of no motivation for the initial movement. I argue that the motivation comes from hypothesis like the VP internal subject hypothesis.

[25] Here I am not representing an extra lower copy within the VP, as it is not necessary for this solution.

Therefore, independently from the assumptions above in (56), there is an alternative plausible solution to the problem raised by Hallman's (2012) case.[26, 27]

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[26] Notice also that in a system with world-indices, the De Re reading Hallman is after doesn't require interpreting the DP above *seem* and therefore we could have the LF in (i) where the DP is reconstructed in an embedded position. Nothing would change with respect to the point above.

(i) seems $\lambda w'$ [[somenon unicorns]$_{w}$] to be in the garden$_{w'}$]

(ii) $\forall w' \in \text{SEEM}_{w}(w')[\exists x[\neg unicorn_{w}(x) \wedge (unicorn_{w}(x) \wedge \ in\text{-}the\text{-}garden_{w'}(x))]]$

[27] Another option which Hallman (2012) discusses is based on Fox's (2002) way of interpreting copies. Fox's (2002) idea is called 'trace conversion' and is an operation that transforms the determiner in the lower copy into a definite determiner and have it bound by the quantifier in the higher copy. For instance, a sentence like (i), repeated from above, would have the LF in (ii).

(i) Polanski likes every movie.

(ii) [$_{DP}$ Every movie] [1 [$_{TP}$ Polanski [$_{XP}$ likes [$_{DP}$ the movie y $\wedge$ y = 1]]]]

The idea Hallman (2012) discusses is that once we have a silent definite description in the structure, we might be introducing presuppositions associated to it, which could then help us in accounting for his problematic case. In particular, we could be introducing an existence presupposition about the NP-argument of the definite description. To illustrate, consider Hallman's sentence again, which would now have the representation in (iii).

(iii) [somenon unicorn]$_{x}$ seems to be [the y unicorns(y) $\wedge$ y = x in the garden(y)]

The existence presupposition we could have here is that there is at least one unicorn. Moreover, as Hallman (2012) discusses, this presupposition appears to project through verbs like *seems* in the case of overt definite descriptions, as shown by examples like (iv), which does presuppose that there exists an actual unicorn.

(iv) It seems that the unicorn is in the garden.

Therefore, if the silent definite in the lower copy has the same presuppositions as its overt counterpart, we would expect the following meaning: there is an actual unicorn *x* and x is actually not a unicorn (and x seems to be in the garden). In other words, we would have a contradiction again, once we consider the presupposition and the assertion together.

Hallman dismisses this explanation because he claims that the presuppositions of the silent definite description of copies cannot be the same as that of overt definites, based on cases like (v), analysed as in (vi).

(v) No unicorn will be on exhibit at the state fair this year.

(vi) [No unicorn]$_{x}$ will be [the unicorn y $\wedge$ y = x] and on exhibit at the state fair this year

The claim is that if an existence presupposition of the lower copy were to project out, (v) would have the contradictory meaning that 'that no unicorn will be the unique real-world unicorn on exhibit at the state fair this year.' Given that (v) is clearly not contradictory, Hallman concludes that the presupposition of silent definite descriptions is different from those of their overt counterpart.

I do not think the argument about (v) is correct: what Hallman overlooks in the case of (v) is that the presupposition of the lower copy is bound by the quantifier in the higher copy. Therefore, the

6. A Note on Triviality

In this section, I briefly discuss some options on how to implement the notion of triviality. As we saw, in a subset of the cases above, we needed the assumption that trivial meanings are banned. A constraint that excludes trivial meanings and triviality as ungrammaticality have been adopted in different linguistic domains (see among others, Barwise and Cooper 1981; Chierchia 1984, 2013; Gajewski 2002; Fox and Hackl 2007). One general issue for these proposals is how to distinguish these trivial meanings from other (at least apparent) contradictions and tautologies that are grammatical, like (69) and (70) for instance (Fox and Hackl 2007).

(69) War is war.

(70) He's an idiot and he isn't.

I think there are at least two options: one is based on the observation that natural language does not seem to lexicalize completely pointless words. Consider as an analogy a word like *dax* that would mean 'it is both true and false.' It is reasonable to think that this is not attested cross-linguistically as a word, though it is conceivable that it could be lexicalized and it would be understood with no difficulties. So one idea would be that non-conservative determiners are pointless in the same way, and one piece of evidence in favor of this route is that one can introduce artificially non-conservative determiners in the language, as I did in this paper, and they seem

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projection behavior that we should expect is not that of a non-bound presupposition like (vii) but rather that of a bound presupposition like (viii).

(vii) No student of mine met the dean today.

(viii) No student of mine brought his iPad today.

Now the projection behavior of bound presuppositions under 'no' is controversial (see Chemla 2009 and references therein for discussion), but we would expect either an existential or a universal projection over the domain of quantification, not projection out. In other words, for (vii) the presupposition is either that some of my students have an iPad or that all of my students do, depending on the theory of presupposition projection one assumes. Similarly, for (v) we expect the presupposition to be that some individual in the domain of quantification is a unicorn or that every individual in that domain is. While it is not trivial to analyze (v) in detail (presumably the domain of quantification of *no* in (v) is over non-existent entities in the first place) - the point is that the presupposition would not be the problematic one that Hallman assumes. But then there is no reason to believe that the silent definite determiner of copies should not have the same presuppositions of their overt counterparts, and therefore the explanation above might become another alternative viable solution for the raising problem. I leave exploring the details of this alternative route for future research.

understandable and usable in a different way than other expressions that are more clearly ungrammatical. For the purposes here an intuitive constraint against the lexicalization of pointless expressions might be enough. It is not obvious, however, how to implement the idea of local triviality checking under this approach.[28]

A second option is, instead, to adopt a more technical notion of triviality, linked to ungrammaticality (Gajewski 2002; see also Chierchia 2013). As mentioned above, the task for this kind of approach is to define a relevant subset of the trivial sentences and link that subset to ungrammaticality. Gajewski (2002) proposes to adopt an algorithm that takes LF structures and transform them by substituting all the non-logical constants with variables with different indices. The output obtained is checked by a semantic system in order to see whether it is trivial. If this system can compute triviality at that level, then the sentence is logically-trivial (always true/false only in virtue of its logical structure) and it is ungrammatical. That is, the hypothesis by Gajewski (2002) is that in (71).

(71) Logically-trivial meanings are ungrammatical.

The relevant question here is whether trivial outputs of sentences containing non-conservative determiners are logically trivial in Gajewski's sense.

(72) Polanski likes everynon movies.

(73) [everynon movie] [λ_1 [Polanski like [everynon movie]$_1$]

The logical constant in this sentence is *everynon*. Crucially, we have to add an assumption about substitution of copies: I will assume that they are substituted in the logical skeleton by the same variable.

(74) [everynon $NP_{1,<e,t>}$] [λ_i [$DP_{2,e}$ $VP_{3,<e,<e,t>>}$ $NP_{1,<e,t>}$]

In this case the sentence would be indeed L-trivial as under every assignment *g*, each instance of $g(NP_{1,<e,t>})$ will always be the same. That is the system would be able to detect the triviality from the logical skeleton alone.

(75) $\forall z[\neg P_{1,<e,t>}(z) \rightarrow (R_{3,<e,<e,t>>}(x_{2,e},z) \wedge P_{1,<e,t>}(z))]$

[28] Thanks to Noam Chomsky (pers. comm) and Ede Zimmermann (pers. comm) for independently pointing out this to me. Thanks to Noam Chomsky also for the example of 'it is both true and false.'

So Gajewski's (2002) account and the assumption that copies are substituted at the logical skeleton by the same variable, can account for the cases above.

7. Conclusion

In this paper, I have developed and explored an account of conservativity based on the copy theory of movement following suggestions in Chierchia (1995), Fox (2002), Ludlow (2002) and Sportiche (2005). The basic idea, which I called the Chierchia-Fox hypothesis, is that non-conservative determiners would not exist because they would always lead to trivial meanings. I have discussed how this is not sufficient to account for the cases of non-conservative determiners that do not lead to triviality and proposed to modify the basic idea, based on the observation that the resulting sentences we obtain with these hypothetical determiners are equivalent to those we would obtain by using some other corresponding conservative determiner meanings. In general, therefore, we cannot be sure whether non-conservative determiners exist because in this syntactic-semantic system they would lead to meanings that are equivalent to ones obtained by corresponding conservative determiners. In addition, in a subset of these cases the meanings obtained would be trivial. For these cases, we can be sure that these hypothetical denotations are not possible – provided triviality is blocked independently. I have also discussed the problems posed by subject DPs, late merge, and raising constructions, and I have proposed to deal with them by assuming that DPs always move from a VP-internal position and that every movement operation triggers a triviality check.

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