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MUCH ADO ABOUT NONSENSE: UNGRAMMATICALITY, SEMANTIC ANOMALY, AND LOGICALITY¹

SUMMARY: In this text, I am going to discuss when things go wrong when using language. In particular, I would like to address a special kind of ungrammaticality: contrary to what is expected within the generativist tradition, there seem to be word-sequences that are *syntactically* unacceptable for *logical* reasons. The semantic works exploring this line of research are usually grouped under the rubric “logicality of language hypothesis”. The aim of this paper is to examine the recent literature that attempts to subsume the observed ungrammaticalities under the umbrella of semantic anomaly, and thus to offer alternative (typological) explanations with respect to language logicality. Some critical issues of these alternative explanations will be highlighted and, while also drawing attention to the weaknesses of the logicality of language hypothesis, the latter will be re-proposed as an explanation that can be sensibly supported (for the time being, at least).

KEY WORDS: ungrammaticality, semantic anomaly, logicality, nonsense, semantic types, logical form.

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1. Introduction

We might have read of Jabberwock's eyes of flame, of Fangorn's trees which can talk (slowly) and walk, and of Ts'ui Pen's book and labyrinth which are one and the same. In a café, we might have heard someone saying that table n. 2 wants the bill, that the sandwich sends its compliments, and that *that*—pointing at a bottle of water—used to be a different shape. Looking dejectedly out of the window on a dreary day, we might have thought that today it is raining and not raining—if only it would rain for good! However, should we conclude from this that we are quite free in the way we use language, we would be wrong.

For those who enjoy investigating when things go wrong, natural languages are the ultimate playground. There can indeed be word-sequences that are syntactically unacceptable, semantically anomalous, or pragmatically infelicitous (if not pragmatically anomalous). According to recent discussion, there can even be word-sequences that are (syntactically) unacceptable for logical reasons. In this paper, I will address the latter issue and examine the literature that attempts to offer alternative explanations.

To better appreciate the arguments discussed in the paper, it is necessary to have a clear understanding of what is meant by 'syntactically unacceptable' and 'semantically anomalous', and what implications there are in assigning a word-sequence to one category or the other. Section 2 thus briefly recalls some introductory notions, and readers may safely skip it if they are already familiar with the subject matter. In Section 3, the logicity of language hypothesis is introduced and its main articulations presented critically. In Section 4, alternative (typological) explanations to language logicity are considered. In Section 5, some critical issues of the typological explanations are presented. Finally, in Section 6 I attempt to clear the field of some possible counter-objections.

2. Unacceptability Comes in Many Forms

To begin with, we can say that syntax is concerned with the structure and arrangement of words into well-formed sentences; semantics deals with the study of meaning, encompassing how words combine to convey propositions; and pragmatics addresses the use of language in communicative contexts.² In the

² According to Stanley (2000), in the literature there are distinct usages of the terms "semantics" and "pragmatics". He mentions three: (i) semantics is the study of context-invariant aspects of meaning whilst pragmatics is the study of those aspects of linguistic communication that depend on context (cf., Montague 1970a, 1970b, 1970c); (ii) semantics interprets expressions relative to contexts and then pragmatics evaluates the output of semantics with respect to general conversational maxims (cf., Bach 1999); (iii) semantics concerns truth-conditions, or propositions, whilst pragmatics is the study of those aspects

generative tradition in linguistics, syntax is a computational system that builds hierarchical structures which are then fed to semantics; semantics interprets the structured representations generated by syntax; and pragmatics is a conversational “postprocessor” external to the grammar (*see* Chomsky 1995). Within this theoretical framework, the concept of grammaticality is solely related to the well-formedness of a sentence at the structural and morphosyntactic level, irrespective of its meaning, whether or not it has ever been used, the very possibility of its use, and its logical status.

It has been proposed that syntactically unacceptable (or ungrammatical) word-sequences can be distinguished, empirically and theoretically, from semantically odd (or semantically anomalous) sentences.³ According to the vulgate, (1) and (2) are ungrammatical, whilst (3) is grammatical, though semantically anomalous.⁴

- 1) *Boy the talked to me.
- 2) *The girls sings “Irony”.
- 3) # Tigers are Zermelo-Fraenkel sets.

Ungrammaticality may result from a phrase-structure violation, as in (1), or from a morpho-syntactic violation, as in (2). When structure-building rules and morphology are respected, we don’t have a mere word-sequence but a sentence which may, however, turn out to be semantically odd (or pragmatically infelicitous or anomalous).

However, it is not clear how (3) should be handled. Does semantic anomaly result in meaninglessness (*cf.*, *ex multis*, Chomsky 1957), in a truth-value gap (*cf.*, *ex multis*, Asher 2011), or in pragmatic infelicity (Magidor 2013)?⁵ In other words, what are the implications of semantic anomaly? Answering this question

of interpretation that take truth-conditions as input, and yield other propositions implicated by the relevant speech act (*cf.*, Stalnaker 1970; Grice 1989). The present paper stems from the latter usage.

³ Initially, the sharp division between ungrammaticality and semantic anomaly seemed empirically confirmed by psycholinguistic evidence coming from event-related potentials (hereinafter ERPs) (Kutas & Hillyard 1980, 1983, 1984), which measure the electrical brain activity, propagated on the scalp, triggered by a specific event. However, closer scrutiny revealed that a one-to-one mapping between P600 (*i.e.*, a centro-parietal positive potential) and syntactic processing, as between N400 (*i.e.*, a centro-parietal negative potential) and semantic processing, seems to be absent (*e.g.*, Coulson & Kutas 1998; Kutas & Federmeier 2011; Osterhout, Kim & Kuperberg 2012). Furthermore, neither of the two ERPs is language-specific, for stimuli in the musical or visual domain may elicit P600 and N400 as well.

⁴ As is customary in the linguistic literature, the asterisk (*) marks ungrammaticality and the pound sign (#) labels semantic anomalies.

⁵ For an overview of semantic anomaly and its meaninglessness or meaningfulness *see* Magidor (2013) and Abrusán (2019).

is preliminary to understanding whether there really is any difference and, if so, of what kind between ungrammatical constructions and semantically odd sentences. Though the comparison between syntactic unacceptability and semantic anomaly played a major role in the early days of generative syntax (Chomsky 1957, 1965) and generative semantics (Harris 1995), today it seems to have lost its momentum, despite the fact that the fundamental question remains unanswered.

Furthermore, it is not always clear why a linguistic construction is odd. As a matter of fact, more and more cases of seemingly ungrammatical word-sequences have started to receive semantic explanations, and pragmatics is now thought to interact with syntax (and semantics) in a fundamental way. A topic that has seen a succession of explanations of various kinds, including one in terms of language logicity which will be discussed later, is the distribution puzzle of negative polarity items (hereinafter NPIs). NPIs cannot occur in any sentence; their most debated property is indeed their limited distribution. For example, the NPI *any* is ‘unlicensed’ in (4a) and licensed in (4b)—it is customary to mark sentences with an unlicensed NPI as ungrammatical, but you should know upfront that there is no consensus yet on the nature of the deviance

- 4) a. *Mandy ate any dinner yesterday.
- b. Mandy didn’t eat any dinner yesterday.

The unacceptability of NPIs in certain contexts, as in (4a), has been argued to follow from semantic (cf., Ladusaw 1979; *see also* Kadmon & Landman 1993) or pragmatic processes (Krifka 1990, 1992, 1995), in contrast with the first syntactic explanations (cf., Klima 1964; Baker 1970; Linebarger 1980, 1987, 1991), and even though (4a) has a tinge of ill-formedness and does not seem semantically deviant.⁶

Ladusaw (1979, 1980a, 1980b, 1983), building upon work by Fauconnier (1975, 1978) and Fodor (1979), proposed that NPIs are only licensed if they are in the scope of a downward entailing operator, i.e., an operator that licenses inferences from sets to their subsets, such as negation (*Mandy didn’t eat fish yesterday* $\Rightarrow$ *Mandy didn’t eat herring yesterday*, where $\Rightarrow$ stands for entailment). Instead, Krifka (1990, 1992, 1995) tried to derive the distribution of polarity items from their semantic structure and independently motivated pragmatic principles related to the illocutionary force of sentences. According to this account, a sentence like (4a) is deviant because what is said *systematically* contradicts what

⁶ Over time, polarity sensitivity has also been explained in terms of (non)veridicality (Giannakidou 1998, 1999, 2002, 2011; Zwarts 1995, 1998), Strawson-entailingness (von Stechow 1999), scope marking (Barker 2018) and harmony (Sbardolini 2024). Chierchia’s (2013) proposal, which helped shape the discussion around language logicity, draws from the work of Krifka (1990, 1992, 1995), Kadmon & Landman (1993), and Lahiri (1998).

is implicated.⁷ There certainly are grammatically harmless pragmatic violations, such as a presupposition failure or a violation of Gricean Maxims,⁸ but in the case of NPIs the pragmatic violation jeopardises the syntactic acceptability of the sentence because it does not depend on the context of utterance. In other words, (4a) can *never* be felicitously uttered. Such cases represent a rather special type of pragmatic infelicity, which may be called “pragmatic anomaly” (Oshima 2006).⁹

In light of the above, semantic or pragmatic processes can lead to what feels like ungrammaticality. But grammaticality is not all there is to consider. The notion of syntactic acceptability has to be disentangled from that of acceptability *tout court*. A word-sequence is grammatical, and is therefore a sentence, if it conforms to the syntactic rules of a given natural language. As far as acceptability is concerned, the focus moves instead from the word-sequence to the speaker’s perception of it (Bard, Robertson & Sorace 1996). As a result, we may have acceptable ungrammatical word-sequences as well as unacceptable grammatical sentences.

Unacceptable grammatical sentences, such as (5), are sentences that are rejected by speakers for reasons that have nothing to do with grammar, but rather with performance-associated factors such as memory limitations or processing constraints, as well as discourse-related, intonational, and stylistic reasons.

5) Dogs dogs dog dog dogs (Barton, Berwick & Ristad 1987).

Acceptable ungrammatical word-sequences, such as (6), are word-sequences which are ill-formed from the syntactic point of view, though they trick the speaker, who may not spot ungrammaticality.

6) *More people have been to Russia than I have (Montalbetti 1984).

Even sentences which are blatantly ungrammatical may actually be acceptable to some degree, which varies depending on the developmental trajectories of speakers (e.g., being late bilinguals or heritage speakers) (Otero 1972). Acceptability is not categorical, but moves along a continuous spectrum (Sprouse 2007).

⁷ Krifka’s (1990, 1992, 1995) idea that a systematic clash of implicatures can lead to ungrammaticality is explored also in Lahiri (1998); Lee & Horn (1994); Van Rooy (2003).

⁸ Uttering the sentence *John stopped smoking* in a context in which it is known that John has never smoked (presupposition failure), or uttering the sentence *John is at home or in the office* in a context in which the speaker knows that John is in the office (violation of Grice’s Maxim of Quantity), may result in a communicative breakdown but it does not seem to lead to ungrammaticality.

⁹ Besides the systematic failure to observe general conversational principles (cf., Krifka 1990, 1992, 1995), it has even been proposed that clashes of presuppositions (cf., *ex multis*, Dayal 1998; Abrusán 2007a, 2007b; Zucchi 1995) can lead to ungrammaticality.

In others words, some acceptable (unacceptable) sentences are more acceptable (unacceptable) than others. On the other hand, a word-sequence is either grammatical or ungrammatical (Leivada & Westergaard 2020).

In this scattered landscape, understanding why and in which sense a given word-sequence sounds wrong is not trivial. In the following Section, some linguistic constructions will be presented as ungrammatical, because they are analysed as such within the hypothesis to be examined. However, it should be emphasised that their status is controversial: in fact, Section 4 will discuss an attempt to consider them no longer as ungrammatical but rather as semantically anomalous.

3. The Logicity of Language Hypothesis and the Analyticity Puzzle

Over the last twenty years, some linguistic studies have logically motivated the syntactic unacceptability of certain linguistic constructions, suggesting that speakers judge a word-sequence as ungrammatical or ill-formed when it turns out to be always false or always true (Gajewski 2002, 2009; Fox & Hackl 2006; Chierchia 2013, 2021; Abrusán 2014; Del Pinal 2019, 2022). Chief evidence in support of the logicity of language hypothesis (hereinafter LLH) comes from word-sequences, such as the (a) entries in (7)–(10), ungrammatical *qua* ultimately contradictory.

- 7) a. *Some student but Sue passed the exam (von Fintel 1993).
b. Every student but Sue passed the exam.
- 8) a. *There are any cookies left (Chierchia 2013).
b. There aren't any cookies left.
- 9) a. *How much does John not weigh? (Fox & Hackl 2006).
b. How much does John weigh?
- 10) a. *How does John regret that he fixed the car? (Abrusán 2007a, 2014).
b. Who does John regret that he invited to the party?

For example, (8a) reveals a contradictory content since the NPI *any* does not occur within the scope of a downward entailing operator, as instead is the case in (8b). Chierchia (2013), building mainly on Krifka (1990, 1992, 1995) and resorting to Rooth's (1985, 1992) focal semantics, analyses (8a) as follows, where *d* is a contextually supplied domain variable:

- 11) a. There are any_D cookies left.
 b. $\exists x \in D[\text{cookies}(x) \wedge \text{left}(x)]$ [D = things in the kitchen].
 c. $\{\exists x \in D'[\text{cookies}(x) \wedge \text{left}(x)]: D' \subseteq D\}$.
 d. There are cookies left in the cupboard.
 There are cookies left on the kitchen table.
 There are cookies left in the oven...

If grammatical, (11a) would be a plain existential with the meaning in (11b). However, (11a) activates the alternatives in (11c), interpreted as in (11d). Since each one of the alternatives entails the assertion, exhaustification via **O**—a phonologically null counterpart of *only* originally posited in Groenendijk & Stokhof (1984)—must eliminate all of them:

- 12) a. **O**_C [There are any_D cookies left].
 b. There are cookies left in the kitchen but.
 there are no cookies left in the cupboard and.
 There are cookies left in the cupboard.
 There are no cookies left on the kitchen table and.
 There are no cookies left in the oven ...

After exhaustification, (12a) “says” that there are cookies left in the relevant domain (in this case, the kitchen), and that there are no cookies left in any of the subdomains. In other words, (12a) is contradictory.

Other word-sequences, such as the (a) entries in (13)–(15), are ungrammatical *qua* ultimately tautological.

- 13) a. *There is every fly in my soup (Barwise & Cooper 1981).
 b. There are some flies in my soup.
 14) a. *Mary is taller than no student is (Gajewski 2008a).
 b. Mary is taller than every other student is.
 15) a. *At least zero students smoked (Haida & Trinh 2020).
 b. Zero or more students smoked.

For example, let’s consider the pattern in (14). Following Gajewski’s (2008a) account, the truth-conditions of comparatives are as in (16).

- 16) A is P -er than Q is = 1 iff
 $\exists d[A \text{ is } d\text{-}P \text{ and } Q \text{ is not } d\text{-}P]$

Given the assumption that gradable adjectives, represented by P in (16), are monotonic, as defined in (17), if Q in (16) is downward entailing we have a tautology.

- 17) A gradable adjective P is monotonic iff $P(d)(x) = 1$ and $d' < d$, then $P(d')(x) = 1$

To see why a tautology is obtained, consider two worlds, w_1 and w_2 , and a domain which consists of the three students: Mary, Marion, and Mabel. In w_1 , Mary = 1.6m, Marion = 1.5m, Mabel = 1.4m. In w_2 , Mabel = 1.6m, Mary = 1.5m, Marion = 1.4m. It is easy to check that (14b), repeated here as (18), makes a contingent statement, whilst (14a), repeated here as (19), is trivially true.

- 18) Mary is taller than every other student is.
 $\exists d$ [Mary is d -tall and every other student is *not* d -tall].
 = 1 @ w_1 , for let $d = 1.6$ m, then Mary is d -tall but no one else is d -tall.
 = 0 @ w_2 since any $d \in$ Mary's height (0, 1.5] is in Mabel's height (0, 1.6].
- 19) *Mary is taller than no other student is.
 $\exists d$ [Mary is d -tall and *no* other student is *not* d -tall].
 = $\exists d$ [Mary is d -tall and every student is d -tall].
 = 1 in both w_1 and w_2 , since d can be between (0, shortest student's height].

As much as LLH seems to have fairly good explanatory power, one cannot help but notice how, in general, blatant contradictions and tautologies are not ungrammatical.

- 20) It is raining and it is not raining.
 21) It is raining or it is not raining.

The asymmetry between the ungrammaticality of certain trivialities and the grammaticality of certain others has to be accounted for. This is the so-called “analyticity puzzle”, also known as the “over-generation of unacceptability challenge”¹⁰ (Del Pinal 2019, 2022).

According to an early articulation of LLH (Gajewski 2002, 2009; Fox & Hackl 2006; Chierchia 2013), one must assume a “natural” (i.e., purely linguistic)

¹⁰ Indeed, if the language system can identify and filter-out expressions which are trivial, then (20)–(21) are expected to be unacceptable as well. Since they are not, an explanation has to be offered.

logic and associate linguistic constructions with particularly austere representations, which reveal truly contradictory or tautological contents only in the case of constructions later judged ungrammatical. According to an alternative articulation, on the other hand, contradictions and tautologies are ungrammatical insofar as it is not possible to transform them into informatively adequate contributions by modulating their lexical content (Del Pinal 2019, 2022; Pistoia-Reda & Sauerland 2021; Pistoia-Reda & San Mauro 2021).

Although the adopted terminology makes explicit reference to “logicality,” it is worth examining how logical this linguistic hypothesis actually is. The next two subsections, besides presenting the two main articulations in more detail, are intended to address this issue.

3.1. L-Triviality and Logical Skeleta

According to Gajewski (2002), there is a formally definable subset of trivial constructions whose members are always syntactically unacceptable. The trivial constructions that belong to this subset are referred to as «L-analytic» or, with a less philosophically loaded terminology, «L-trivial».

The structure that Gajewski takes as a reference for assessing the L-triviality of linguistic constructions is not the Logical Form (hereinafter LF) to which linguists are traditionally accustomed, and it is not the logical form of logicians either. L-triviality is assessed on a modified LF, called «logical skeleton» (hereinafter LS), where all nonlogical material has been non-uniformly replaced by a new variable of the same semantic type.

Definition 1 (Logical Skeleton) A logical skeleton (LS) is a modified logical form (LF) where all nonlogical material has been non-uniformly replaced by a new variable of the same semantic type

The intuition behind the assumption of logical skeleta is that the grammar treats all occurrences of nonlogical items as independent.¹¹ For example, the LS and corresponding interpretation of constructions such as (22) and (23) are as follows:

¹¹ This intuition is not entirely extravagant. Within the theoretical framework of Distributed Morphology (hereinafter DM; *see*, e.g., Halle & Marantz 1993, 1994), structures quite similar to logical skeleta correspond to an actual stage of the derivational process. According to DM, syntax operates on functional morphemes lacking phonological content, and vocabulary insertion (or exponence) happens post-syntactically. However, even if a representation close to logical skeleta really existed, it does not mean that this is the level where logical triviality is computed and sanctioned. If it were, unacceptability would be overgenerated in some cases and undergenerated in other cases (cf., Del Pinal 2019; Abrusán 2014; Chierchia 2013): e.g., co-binding of predicative variables; weak presuppositional islands in manner questions; and the distribution of the negative polarity item *any*, as long as we want to avoid additional *ad hoc* stipulations.

- 22) There are some students.
- a. LS: $[there [are [some P_{1, <e, I>}]]]$.
 - b. Interpretation: $\llbracket some \rrbracket(I(P_1))(D_e) = 1$ iff $I(P_1) \cap D_e \neq \emptyset$.
- 23) *There is every student
- a. LS: $[there [is [every P_{1, <e, I>}]]]$.
 - b. Interpretation: $\llbracket every \rrbracket(I(P_1))(D_e) = 1$ iff $I(P_1) \subseteq D_e$.

Granting the assumption that the expletive *there* denotes the domain of individuals D_e , (22) can be paraphrased as ‘the intersection of the set of students and the domain D_e is not empty’, and this paraphrasis *can* be false (if there are no students). In contrast, (23) can be paraphrased as ‘the set of students is a subset of D_e ’; since the empty set is also a subset of D_e , this paraphrasis cannot be false. In other words, (23) is L-trivial and *therefore* ungrammatical.

Definition 2 (Being L-Trivial) A construction S is L-trivial if, and only if, the truth value of its LS is equal to 1 (or 0) in all interpretations (in which S is defined)¹²

In light of the above, within the early articulation, LLH is phrased in the following terms:

Hypothesis (Language Logicality) A construction S is ungrammatical if it is L-trivial, or if its LS contains an L-trivial construction

As already highlighted, logical skeleta are particularly austere representations, different from LF. Are they logical at all? From a purely linguistic perspective, the logical properties of a construction may be derived directly from a LF associated with it, or from a representation of that LF in a suitable formal language—in this second case, the logicians’ logical form would be a formal representation of LF (Iacona 2018). Since logical skeleta are radically underspecified with respect to their nonlogical/lexical content, it is reasonable to argue that the logical form (and the logical properties exhibited by it) pertains to a different level of representation, where the relations of identity or difference between nonlogical/lexical

¹² Gajewski (2002) makes appeal to a kind of analyticity first noticed by Davidson, that of sentences which remain true under all significant rewritings of their nonlogical parts (Davidson 1997). Gajewski’s *nonuniform* replacement recalls the uniform replacement that Abelard used to define the formal truth of an inference. Indeed, Abelard termed perfect those inferences whose necessity depends on the very structure (*complexio*) of the proposition, for all the (nonlogical) items occurring in the inference can be uniformly replaced by any other (nonlogical) item, without the consecution being affected (*Dialectica*: 255, 310–34). Since, as we will see, logical skeleta are a syntactic representation, one may wonder whether they are adequate to explicate L-triviality (cf., García-Carpintero 2004).

items are recovered. As a result, Gajewski's skeleta are certainly functional, but are logical only indirectly, i.e., in so far as they make the logical material visible, whilst logical properties (which require the unveiling of any co-occurrences of the nonlogical items) remain hidden.

3.2. Informativity, LF, and Rescale

Del Pinal (2019, 2022) reverts to the usual LF, which recognises possible multiple occurrences of the same nonlogical/lexical item, and innovates it. The LF of linguistic constructions, as it is usually understood, is a level of representation that preserves all the semantically relevant features of the sentence (e.g., its lexical content), but is purged of imperfections such as ambiguity. The convention of dubbing this form "logical" stems from the conviction that the derivation of a syntactic structure displaying the logical properties of a sentence is continuous with the derivation of other syntactic representations of such a sentence (Chomsky 1976; May 1977). LF is currently understood as a syntactic representation that differs from surface structure and is the primary object of interpretation. Such a syntactic representation is not a logical form in the sense of logic or philosophy, for it is not expressed by means of a formula of a formal language.

Within the alternative articulation of LLH, it is assumed that, at the LF level, nonlogical/lexical items can be the subject of operators that modulate their meaning, similar to what has been proposed, *ex multis*, by Sauerland (2014). More precisely, nonlogical/lexical items may be the subject of a Rescale operator, whose specific contribution depends on the context of utterance. Thus, co-occurrences of a nonlogical/lexical item may actually have a different meaning if (and as) one or more occurrences are modified by Rescale. By contrast, the latter cannot operate on logical/functional items, whose meaning cannot be modulated.¹³

In the broader philosophical literature, meaning modulation covers *optional* processes such as free enrichment, loosening, metonymic transfer, etc. Such processes may be accounted for in terms of truth-conditional pragmatics (Recanati 2010) or relevance theory (Carston 1997, 2002; Sperber & Wilson 1986a, 1986b). However, being syntactically represented, Rescale is closer to a covert optional. Covert optionals have been proposed, *ex multis*, by Martí (2006), Stern (2000, 2006), and Jacobson (2005), to account for the effects of free pragmatic processes while claiming that they are not pragmatic processes at all, but regular processes of semantic interpretation applied to covert elements in the syntax.

Rescale can either strengthen or weaken the meaning of a nonlogical/lexical item, according to the two definitions below, where *P* is the item on which it operates, *x* is an argument of the appropriate type, and *c* is the context.

¹³ In the wake of Del Pinal's analysis is a recent proposal by Chierchia (2021), who argues that LFs can and sometimes should be modulated through the insertion of «replacement functions» at their referential points.

Definition 3 (Rescale_c⁺) $\{x : \text{Rescale}_c^+(P)(x)\} \subset \{x : P(x)\}$

Definition 4 (Rescale_c⁻) $\{x : \text{Rescale}_c^-(P)(x)\} \supset \{x : P(x)\}$ ¹⁴

Meaning modulation can operate multiple times, provided that $\{x : \text{Rescale}_c^+(P)(x)\} \subset \{x : \text{Rescale}_c^+(P)(x)\} \subset \{x : P(x)\}$:

24) If John is wrong, then he is wrong.

LF+Rescale⁺: $[[\text{If} [\text{John} [\text{is} [\text{wrong}]]]] [\text{then} [\text{he} [\text{is} [\text{Rescale}_c^+(\text{wrong})]]]]] \approx$
If John is wrong, then he is totally wrong.

LF+Multiple Rescale⁺: $[[\text{If} [\text{John} [\text{is} [\text{Rescale}_c^+(\text{wrong})]]]] [\text{then} [\text{he} [\text{is} [\text{Rescale}_c^+(\text{wrong})]]]]] \approx$ If John is somewhat wrong, then he is totally wrong.

It also seems that order considerations are relevant for the fruitful application of Rescale:

25) It is snowing and it is not snowing.

LF+Second Rescale⁺: $[[\text{It} [\text{is} [\text{snowing}]]] \text{ and } [\text{it} [\text{is} [\text{not} [\text{Rescale}_c^+(\text{snowing})]]]]] \approx$ It is snowing and it is not snowing heavily.

LF+First Rescale⁺: $[[\text{It} [\text{is} [\text{Rescale}_c^+(\text{snowing})]]] \text{ and } [\text{it} [\text{is} [\text{not} [\text{snowing}]]]]] \approx$ It is snowing heavily and it is not snowing.

LF+Second Rescale⁻: $[[\text{It} [\text{is} [\text{snowing}]]] \text{ and } [\text{it} [\text{is} [\text{not} [\text{Rescale}_c^-(\text{snowing})]]]]] \approx$ It is snowing and there is no atmospheric event.

LF+First Rescale⁻: $[[\text{It} [\text{is} [\text{Rescale}_c^-(\text{snowing})]]] \text{ and } [\text{it} [\text{is} [\text{not} [\text{snowing}]]]]] \approx$ There is an atmospheric event and it is not snowing.

As illustrated by (25), Rescale_c⁻ does not seem sufficient to repair the formal contradiction if applied to the second occurrence of the nonlogical/lexical item, whereas it may have some effect if applied to the first. Conversely, Rescale_c⁺ is only effective when applied to the second occurrence, failing to resolve formal contradictoriness when applied to the first.

Since Rescale cannot modulate the meaning of logical/functional items, constructions such as (26) can never be made informative and are *therefore* ungrammatical.

¹⁴ Added by Pistoia-Reda & Sauerland (2021) to account for the syntactic acceptability of material trivialities (e.g., *This round table is square*). Del Pinal (2019) understood meaning modulation in the sense of specialisation of meaning, i.e., exclusion of nonstandard readings.

25) *Some students but John smoke.

LF+Rescale⁺: [*Some* [Rescale_c⁺(*students*) [*but John*]] *smoke*] ≈ Some philosophy students but John smoke.

As a first approximation, to be reviewed later, what is visible at the level of LF is not the final product of meaning modulation (e.g., *it is snowing and it is not snowing heavily*), but the relations of entailment between the modulated and unmodulated lexical items which co-occur (i.e., the fact that Rescale_c⁺(*snowing*) entails *snowing*, but not vice versa, whence the dissolution of the superficial contradiction).

In light of the above, within the alternative articulation, the phrasing of LLH changes:

Hypothesis (Language Logicity') A construction *S* is ungrammatical if it remains tautological or contradictory for all applications of Rescale to its nonlogical material.

The difference between the two articulations is not merely a matter of lexical preferences. LS and LF+Rescale are clearly distinct: indeed, it is one thing to say that the syntactic structure of (27) includes two distinct items $P_{1,<e,l>}$ and $P_{2,<e,l>}$, for we have two distinct predicates, as per (27a); quite another thing is to say that the syntactic structure of (27) includes two related items *windy* and Rescale_c⁺(*windy*) because the two occurrences of *windy* have (or may have) a different meaning, as per (27b).

27) It is windy and it is not windy.

- a. LS: [[*It* [*is* [$P_{1,<e,l>}$]]] *and* [*it* [*is* [*not* [$P_{2,<e,l>}$]]]]].
- b. LF+Second Rescale⁺: [[*It* [*is* [*windy*]]] *and* [*it* [*is* [*not* [Rescale_c⁺(*windy*)]]]]] ≈ It is windy and it is not extremely windy.
- c. LF+First Rescale⁻: [[*It* [*is* [Rescale_c⁻(*windy*)]]] *and* [*it* [*is* [*not* [*windy*]]]]] ≈ There is an atmospheric event and it is not windy.
- d. LF+Multiple Rescale⁺: [[*It* [*is* [Rescale_c⁺(*windy*)]]] *and* [*it* [*is* [*not* [Rescale_c⁺(*windy*)]]]]] ≈ It is slightly windy and it is not extremely windy.

One may argue that LF+Rescale is more logical than LS, for the relations of identity or difference between nonlogical/lexical items are recovered. However, to account for embedded uses of acceptable trivialities in non-asserted positions, as in (28), it has been proposed that every nonlogical/lexical item is paired with a plain vanilla Rescale, lacking any specification, which may then be contextually (not compositionally) realised as Rescale_c⁺, Rescale_c⁻, or remain inert (i.e., compute the identity function). As a result, it is technically possible that, for some *c*, *c'*, Rescale_c(*P*) = *P*, or that Rescale_c(*P*) = Rescale_{c'}(*P*), otherwise it would be hard

to explain why in (28) the embedded contradiction is read in its triviality and grammatical nevertheless.

28) John is so crazy, he believes it is windy and it is not windy.

29) LF+Plain Vanilla Rescale: $[[It [is [Rescale_c(windy)]]] \text{ and } [it [is [not [Rescale_c(windy)]]]]]$.

This strategy does not seem entirely consistent with the functioning of Rescale and the consequences one wishes to draw from it. Attaching a plain vanilla Rescale to each nonlogical/lexical item might make sense if I were free to realise the operator as I wished (e.g., in (29) I can leave the first inert and use the second one to strengthen the predicate). But I am not free, as long as the preferred outcome is an informative contribution: as noted above, order considerations are relevant ($Rescale_c^+$ is only effective when applied to the second occurrence of the predicate, whilst $Rescale_c^-$ should be applied to the first to have any benefit), and there are constraints to obey in case both $Rescale_c(windy)$ and $Rescale_c(windy)$ are to be realised, as highlighted earlier. These remarks would not rock the boat if it were only a matter of pragmatic felicity and one did not want to derive ungrammaticality from ineffective modulation. But as soon as it is claimed that tautologies and contradictions are ungrammatical unless they can be made informative, LF cannot be so indeterminate. In order to state that (27) is grammatical, I consider the possible *results* of modulation, that is, at least one of (27b–d). Similarly, I consider the possible results of modulation to conclude that (26) is ungrammatical. If I were to consider (29) for (27), then I would have to consider (30) for (26), but what conclusion could I draw from this without pondering the possible outcomes of different Rescale's realisations?

30) LF+Plain Vanilla Rescale: $[Some [Rescale_c(students) [but Rescale_c(John)]] Rescale_c(smoke)]$.

It is not the generic presence of Rescale that affects grammaticality, but the result that Rescale's realisations yield or do not yield. This observation, coupled with the fact that the full modulatory effect of Rescale is determined only after the contextual parameters are provided, implies that the language's deductive-inferential system, which automatically identifies and filters out expressions with trivial interpretations according to LLH, is frozen: on closer inspection, what is visible at the level of LF are not even the entailments between the modulated and unmodulated lexical items which co-occur. Furthermore, Rescale is no longer optionally generated, thus setting itself apart from a covert optional as well.

In addition to the internal diatribes concerned with how to characterise LLH, in order to make it as explanatory as possible with respect to the analyticity puzzle and the least theoretically problematic, one must also consider external (at least in their intentions) attempts to account for the syntactic unacceptability of the (a) entries in (7)–(10) and (13)–(15). In particular, the rejection of similar

constructions has recently received typological explanations, i.e., explanations in terms of a failure of composition (Abrusán, Asher & Van de Cruys 2021). The next Section is devoted to illustrating this proposal, which presents itself as an alternative to LLH.

4. Logicality *or* Types

According to LLH, the (a) entries in (7)–(10) and (13)–(15) are only superficially uninterpretable: when analysed, they receive an interpretation, which is that of being either contradictory or tautological. According to Abrusán, Asher & Van de Cruys (2021), these very same constructions are instead uninterpretable for, in building up their semantic representation, an insuperable semantic problem is encountered.

If the (a) entries in (7)–(10) and (13)–(15) were syntactically unacceptable because of a failure of composition, then they would be similar to examples of semantic anomaly, such as (31).

31) #My toothbrush is pregnant.

Semantic anomaly is the result of a type presupposition that cannot be satisfied (cf., Asher 2011 and the richly typed semantics therein).¹⁵ The idea of semantic types is familiar from Montague Grammar. Asher (2011), however, proposes a context sensitive model of type-driven lexical semantics in the framework of type composition logic (hereinafter TCL), where the Church-Montague system of functional types is extended over the base types *e* (entities) and *t* (truth values) to a much richer system incorporating subtypes of *e* and *t*, or *prop* (propositions).¹⁶

TCL distinguishes between the external and the internal content of an expression. The former corresponds to the model-theoretic meaning that determines the appropriate extension of the given expression at points of evaluation; the latter is encoded in types. For instance, the external content or extension of “raspberry” is a set of raspberry portions at some world and time, whilst its internal content or type is given by the features normally associated with it—e.g., it’s a berry, it’s to eat, it’s bittersweet.

¹⁵ Ryle (1949) would have called (31) a “category mistake”, for a property (being pregnant) is ascribed to a thing (a toothbrush) that could not possibly have that property.

¹⁶ Besides being understood logically (i.e., *e*, *t*, *<e*, *t>*, etc., in the Montagovian tradition), in semantics the word “type” can be understood conceptually. In the latter sense, a type is an abstract and stable conceptual category that represents a general pattern or class of entities, events, or relations. It serves as a mental template that individual instances (tokens) are understood as belonging to. Lexical items map onto conceptual types, which structure meaning. I am grateful to an anonymous reviewer for suggesting that this other notion should be mentioned as well. To delve deeper into the conceptual structure of meaning, see, *ex multis*, Langacker (1990).

The internal content tracks the external content, in that it should normally yield the correct extensions for expressions. Indeed, in normal circumstances (but not in all cases; cf., Kripke 1980; Putnam 1975), the internal content determines appropriate truth-conditions for sentences: the features encoded in it normally enable speakers to correctly judge whether an entity falls under the extension of a term or not.

In TCL, the set of types forms a semi-lattice ordered by the subtyping relation. Therefore, for each syntactic category there is a maximal type. For example, questions and propositions are both maximal types. Similarly, there is no higher type above *e*, though there are many subtypes under it. It is further assumed that the highest types in the type hierarchy have semantic properties that are important for grammaticality. When the type presuppositions of predicate and argument are completely compatible, composition succeeds and a logical form is obtained. When the type presuppositions of predicate and argument are not completely compatible, context might shift them, but only to a limited degree, so composition might not succeed.

Abrusán, Asher & Van de Cruys (2021) resort to Distributional Semantics (hereinafter DS) to distinguish which aspects of meaning can shift and which ones cannot (cf., Abrusán, Asher & Van de Cruys 2018; *see also* Asher et al. 2016). Briefly, DS is a computational approach to natural language semantics based on the “distributional hypothesis” by Harris (1954), according to which the meaning of a word may be inferred from its context. One way of thinking about the meaning of a word within DS is to assume that it is a vector in some space *V* whose dimensions are contextual features. The vector captures the co-occurrence frequencies of the given word with all the other words and/or grammatical features or dependency relations within a predefined context window in a corpus. A word by context matrix is obtained by recording the vector meaning for each word. Then, dimensionality reduction techniques are employed to reduce the abundance of overlapping contextual features to a limited number of meaningful, latent semantic dimensions. To sum up, DS generates vectors to capture individual word meaning and, via dimensionality reduction, to bring out latent dimensions that might correspond to semantic features.

As far as (31) is concerned, the type is so high in the type-hierarchy that it has no neighbours that share the same syntactic or semantic dependencies; therefore there is nowhere in the space for its meaning to shift. As far as the (a) entries in (7)–(10) and (13)–(15) are concerned, the type denotes a context-invariant logical meaning that is simply invisible for DS, since it is present in all contexts. Furthermore, whereas in (31) type conflict arises at the level of predicate-argument composition, in LLH’s examples type conflict arises at a more global level, and therefore involves more linguistic elements (and types, as a consequence). The above should explain the intuitive difference between (31), which is semantically anomalous but grammatical, and the (a) entries in (7)–(10) and (13)–(15), which are «ungrammatical for semantic reasons» (Abrusán, Asher & Van de Cruys 2021: 276).

To better understand the point, let's consider (7a), repeated here as (32):

32) *Some student but Sue passed the exam.

An explanation in terms of language logicity: von Fintel (1993) offers an account of connected exceptive phrases which has greatly influenced much of the subsequent discussion. To begin with, *but*-phrases are not merely a matter of domain subtraction. In fact, to be acceptable, they necessarily have to rescue the quantificational statement: without the exception, the sentence should be false. Furthermore, the complement of *but* should be the least that you have to take out of the restrictor of the host quantifier to make the statement true. In other words, the exception set is the smallest set such that, if it is subtracted from the quantifier domain, the quantification comes out true.¹⁷

Let's consider first the grammatical case, i.e., (7b) repeated here as (33). The correct entry for *but* is not the one in (33a), which would not entail that Sue did *not* pass the exam, but one closer to (33b), where $D(A - C)(P) = 1$ captures domain subtraction and $\forall S[D(A - S)(P) = 1 \rightarrow C \subseteq S]$ the uniqueness condition (i.e., 'the *least* you have to take out' clause):

33) Every_D [student_A but Sue_C] passed the exam_P.

- a. $\llbracket but \rrbracket(C)(A) = A - C$.
- b. $\llbracket but \rrbracket(C)(A)(D)(P) = 1$ iff
 $C \neq \emptyset$ and $D(A - C)(P) = 1$ and $\forall S[D(A - S)(P) = 1 \rightarrow C \subseteq S]$.

The domain subtraction clause and the uniqueness condition together ensure that *C* contains all and only the exceptions to the quantified statement. The uniqueness condition also helps explaining the co-occurrence restrictions of *but*-phrases: amongst determiners, only the universal ones, e.g., *all* (and its synonyms) and *no* (and its synonyms), guarantee the existence of a unique exception set—if there is any at all.

To begin with, consider that universal positive/negative determiners license inferences from sets to their subsets in their restrictors, for they are left downward monotone:¹⁸

¹⁷ One can talk about an exception set because, as first noticed by Hoeksema (1987), only NPs that can be taken to denote sets can be the complement of *but*:

a) *All the students but each foreigner.

In light of the above, the type-shifting mechanisms of Partee (1987), especially the type-shift rule that lowers a generalised quantifier to a set, turn out to be particularly useful for the compositional analysis of exceptive phrases.

¹⁸ Barwise & Cooper (1981) use the term "anti-persistent". According to Gajewski (2009), the possible hosts for connected exceptive phrases are only negative universals, and the class might also be described as that of the left anti-additive determiners (cf., van

- 34) Every human being is mortal.
 $\Rightarrow$ Every male human being is mortal.
- 35) No human being is immortal.
 $\Rightarrow$ No male human being is immortal.

Definition 5 (Left Downward Monotonicity) D is a *left downward monotone* ($\downarrow\text{mon}$) quantifier iff $\forall A, B, C$ s.t. $\llbracket D \rrbracket(A)(C) = 1$ & $B \subseteq A$, $\llbracket D \rrbracket(B)(C) = 1$

Instead, left upward monotone determiners (e.g., *some*) license inferences from sets to their supersets in their restrictors:

- 36) Some female human being is an athlete.
 $\Rightarrow$ Some human being is an athlete.

Definition 6 (Left Upward Monotonicity) D is a *left upward monotone* ($\uparrow\text{mon}$) quantifier iff $\forall A, B, C$ s.t. $\llbracket D \rrbracket(A)(C) = 1$ & $A \subseteq B$, $\llbracket D \rrbracket(B)(C) = 1$

Interestingly enough, when a left upward monotone determiner is used in a *but*-phrase, we get immediate falsity.¹⁹

To appreciate this point, let's address the ungrammatical case, i.e. (32). Let's denote by *student* the collection of all students and by the constant *s* the individual Sue. On the one hand, the exceptive should make the quantified formula false over *student* and true with regards to a subset *X* of *student*, e.g., *student* \ {*s*}. On the other hand, the existential quantifier is upward monotone; therefore, if a quantified formula is true over *X*, then it is also true over all supersets of *X*, including *student*.

In other words, (32) entails the following, from an informal and a formal point of view respectively:

- 37) [Some student - Sue] passed the exam and it is not the case that some student passed the exam.
- 38) $\exists x \in D - s: \text{Passed the exam}(x) \wedge \neg \exists x \in D: \text{Passed the exam}(x)$

Because of the left upward monotonicity of *some*, we have:

- 39) $\exists x \in D: \text{Passed the exam}(x) \wedge \neg \exists x \in D: \text{Passed the exam}(x)$

Benthem 1984). A determiner D is left anti-additive iff $\forall A, B, C$: $\llbracket D \rrbracket(A \cup B)(C) = 1$ iff $\llbracket D \rrbracket(A)(C) = 1$ & $\llbracket D \rrbracket(B)(C) = 1$.

¹⁹ For simplicity, in the following we ignore the left non-monotonic quantifiers such as *exactly n*, which also cannot host connected exceptives.

To sum up, non-universal determiners guarantee the absence of a unique exception set and their interaction with *but* yields automatic falsity.

An explanation in terms of semantic anomaly: In a sense, Abrusán, Asher & Van de Cruys (2021) transpose von Fintel's (1993) insights into TCL. Considering a connected exceptive construction of the form $D A \text{ but } C P$ (e.g., $\text{Every}_D \text{ student}_A \text{ but Sue}_C \text{ passed the exam}_P$), and given von Fintel's (1993) truth-conditions, the *but*-phrase entails that a property P is the argument of $D A \text{ but } C$ iff $\{A - C, A \cap C\}$ forms a partition of A that corresponds exactly to the partition of A , $\{P \cap A, P^c \cap A\}$, where P^c is the complement of P . As a result, a connected exceptive holds of properties that induce a partition over the restrictor set A . Therefore, there is a type presupposition on A and C : the type of object that is a C must be a subtype of the type of object that is an A . Furthermore, there is a type presupposition on the determiner that A combines with: whichever it is, it must entail a partition of A in order for composition to succeed. However, only left downward monotone determiners, like *every* and *no*, can do this. $A \text{ but } C$ does not compose with determiners which are not left downward monotone, like *some*. The context-invariant logical meaning that the type denotes in this case, and that is responsible for the composition failure, is the invariant meaning of determiners and their monotonicity properties.

5. Logicality and Types

One of the merits of the typological explanation proffered by Abrusán, Asher & Van de Cruys (2021) is that of keeping two levels of analysis distinct. Indeed, it is one thing to say that a sentence expresses a proposition with trivial content, and quite another to say that a word-sequence does not express any proposition for formal reasons. Normally, ungrammatical constructions are considered to be meaningless and hence not interpretable as no truth-conditions can be provided for them. Instead, LLH seems to collapse these two profiles, explaining the ungrammaticality of certain word-sequences by their tautological or contradictory content, thus by their truth-conditions.²⁰ This merit of the typological explanation might be downplayed, but not entirely eliminated, by pointing out that the contradictoriness or tautologicality of constructions such as the (a) entries in (7)–(10) and (13)–(15) is unconscious, since the speaker is unaware of their logical status, just as she is unaware of many grammatical rules that motivate her grammaticality judgements: speakers only have tacit knowledge of the language.

Another merit of the analysis by Abrusán, Asher & Van de Cruys (2021) concerns the distinction between logical and nonlogical items in natural languages. Although the existence of the two classes of items may seem intuitive, the task of finding a discriminating semantic difference has proved far from easy. Nonethe-

²⁰ Though we may say, with Wittgenstein, that «The tautology has no truth-conditions, for it is unconditionally true; and the contradiction is on no condition true» (TLP 4.461).

less, LLH assumes that such a distinction can be elicited with some clarity. Drawing on the logical tradition, it has been proposed that those items whose meanings do not change when certain algebraic transformations are made in their domains are logical.²¹ The basic idea is that logical meanings are «topic-independent», or «topic-neutral»: the validity of a logical inference should not depend on the particular properties of what is being discussed.

However, similar strategies seem inadequate for natural languages, for they predict that some nonlogical items are logical and that some intuitively logical items are nonlogical (cf., Gajewski 2002; van Benthem 2002; Abrusán 2019). According to Abrusán, Asher & Van de Cruys (2021), difficulties such as these suggest that the logical/grammatical and conceptual aspects of meaning are not univocally traced to two different classes of items. Both classes of items could well have both logical and conceptual aspects in their meaning.²² Such a stance may have interesting connections with the graded account of logicity proposed by Sagi (2018), where all logical items are invariant under isomorphisms, but some are more logical than others.

Moving now to the possible critical issues of typological explanations, I will focus on the example of connected exceptive phrases. Empirically, the distribution of *but*-phrases seems less categorical than assumed. In fact, they also happily co-occur with non-universal quantifiers, as illustrated by (40) and (41), from Peters & Westerståhl (2023) (see also García-Álvarez 2003):

- 40) On the import side, a weakened economy explains the decline in imports from most countries but China.
- 41) Egypt, following years of chaos, is struggling to secure financial assistance and investment, something few countries but China can offer.

Furthermore, when co-occurring with non-universal quantifiers, connected exceptives do not always mark out counterexamples that would falsify the gener-

²¹ The transformations suggested to ascertain logical constants are many: invariance under surjective functions (Feferman 1999), invariance under permutation (Sher 1991; Tarski & Givant 1988; van Benthem 1989), invariance under potential isomorphism (Bonnay 2008), and so forth.

²² It is worth pointing out that both the articulation proposed by Del Pinal (2019, 2022) and that proposed by Chierchia (2021) may accommodate this perspective on logical and nonlogical items. On the other hand, it seems that the articulation proposed by Gajewski (2002, 2009) cannot do that. Gajewski (2002, 2009) opts for invariance under permutation (more precisely, for van Benthem's (1989) extension to typed languages), and the ability to distinguish clearly and unambiguously between logical and nonlogical items is the basis of his logical skeleta. Indeed, logical skeleta are justified as long as nonlogical items have no logical trait that might be visible to grammar. Abandoning this assumption would amount to proposing an entirely different articulation, rather than counting as a defence of the original one.

alization were they not excluded from its domain. Consider (42), from Peters & Westerståhl (2023):

- 42) a. We are available most days.
 b. We are available most days but Sundays. Also, we are unavailable on national holidays.

The first sentence in (42b) can be true while at the same time (42a) is true—indeed, that would normally be the case. Furthermore, the consistency of the second sentence in (42b) with the first shows that exceptions (i.e., days when the speakers are not available) can exist outside the subset referenced by the *but*-phrase.

These empirical facts could be highly context-dependent and not indicative of a pervading phenomenon. However, the puzzle in the semantics of *but*-phrases raised by Gajewski (2008b) is piercing and has repercussions for von Stechow's (1993) analysis but also for Abrusán, Asher & Van de Cruys's (2021): i.e., the acceptability of connected exceptive phrases modifying NPs headed by NPI *any*, as illustrated by (43).²³

- 43) a. Mary didn't see anyone but Bill.
 b. No man saw any woman but Mary.

In the literature, there are two opposing theories on the semantics of NPI *any*. Under one theory, NPI *any* denotes a universal determiner that must take wide scope over negation (Quine 1960; Lasnik 1972). This theory would explain the compatibility between NPI *any* and *but*-phrases straightforwardly, however over time it has been abandoned in favour of the competing view. Under this other theory, NPI *any* denotes an existential determiner that must occur in the scope of a downward entailing operator (cf., Ladusaw 1979), as mentioned earlier. Advocates of this position have given a number of arguments to show that NPI *any* must receive a narrow scope existential reading in some contexts, such as, for instance, (44) and (45) (cf., Heim 1987; Kadmon & Landman 1993).

- 44) There aren't any students in the room.
 45) Few students read any book on the list.

Crucially, NPI *any* is compatible with a connected exceptive phrase even in those environments that favour its existential analysis, as illustrated by (46) and (47), from Horn (1972):

²³ Gajewski (2008b) also addresses the ability of a negative universal quantifier modified by a *but*-phrase to license strong NPIs.

46) There isn't anyone in the room but Bill.

47) Few boys talked to any girl but Sue.

Sentences such as (46) and (47) challenge von Fintel's (1993) analysis. If *any* is an existential determiner, then it is left upward monotone. Under von Fintel's (1993) semantics, all left upward monotone determiners yield trivial truth-conditions when combined with a *but*-phrase. As a result, von Fintel (1993) predicts trivial truth-conditions for (46) and (47) and consequently expects them to be ungrammatical, contrary to fact. But Abrusán, Asher & Van de Cruys's (2021) analysis does not go much further: since only left downward monotone determiners allow composition to succeed, (46) and (47) are predicted to be irredeemably semantically anomalous and therefore uninterpretable.

Besides being perfectly grammatical, (46) and (47) even have entailments that a theory of connected exceptive phrases should account for: (48) is true iff (49a–c) hold.

48) John didn't see any student but Mary.

49) a. Mary is a student.

b. John saw Mary.

c. John didn't see a student who was not Mary.

von Fintel's (1993) analysis, although flawed, can be fixed. In fact, Gajewski's (2008b) proposed solution is based on it and stems from the idea that its uniqueness condition, renamed "leastness condition", is rooted in pragmatics. Gajewski (2008b) makes the following assumptions on *but*: (i) it denotes set subtraction, and (ii) it introduces alternatives to its complement. The mechanisms of focus-marking are used to introduce alternatives, and a structured meaning approach to focus (cf., Jacobs 1983; Krifka 1991) is assumed. For example, the focus denotation of *no student but Sue passed the exam* is the following:

50) $\langle \lambda X. \{y : y \text{ passed the exam}\} \in \llbracket no \rrbracket (\{x : x \text{ is a student}\} - X), \{Sue\} \rangle$.

Given these assumptions, Gajewski (2008b) proposes that a *but*-phrase must be c-commanded at LF by a pragmatic strengthening operator called LEAST.

51) $LEAST(\langle F, X \rangle) = 1$ iff $F(X) = 1$ & $\forall S[F(S) = 1 \rightarrow X \subseteq S]$.

LEAST belongs to the same class of operators as Chierchia's (2004, 2006) **O** and **σ**, Fox's (2006) *exh*, and Kadmon's (1987) maximality operator *M*, but its contribution is not defeasible. According to Gajewski (2008b), assigning LEAST the appropriate scope will solve the puzzle of NPI *any* and connected exceptive phrases co-occurring felicitously: indeed, LEAST is not required to always im-

mediately c-command the connected exceptive phrase, it can apply to any node of type *t* dominating the *but*-phrase.

Let's consider (48) as a concrete example. An LF in which LEAST takes scope just above the NPI *any student* and below sentential negation is ill-formed, since it leads to trivial truth-conditions (as in von Stechow's analysis):

- 52) *LF of (48) = [not [LEAST [any [student – Mary_f] 2 [John saw *t*₂]]]].

However, other LFs are available for (48). In particular, LEAST can take scope at the root node:

- 53) LF of (48) = [LEAST [not [[any student – Mary_f] 2 [John saw *t*₂]]]].

Given that:

- 54) [[not [[any student – Mary_f] 2 [John saw *t*₂]]]] = [[no student – Mary] 2 [John saw *t*₂]].

the truth-conditions of (48), accounting for the entailments in (49a–c), are the following:

- 55) *John saw no student but Mary* is True iff
 $\{x : x \text{ is a student}\} \cap \{x : \text{John saw } x\} = \{\text{Mary}\}$

In summary, von Stechow's (1993) analysis of connected exceptives is not perfect, but it has proven capable of being revised without being distorted (*see* also Hirsch 2016; Hsieh 2016), and still represents the most accredited explanation of *but*-phrases today.

6. Three Defences Against One Counter-Objection

In distinguishing which aspects of meaning can shift and which ones cannot, DS is not that far from Rescale, the difference being that, for the former, meaning shift, when possible, happens at the (co-)compositional level. In fact, the critical objective of Abrusán, Asher & Van de Cruys (2021) is the early articulation proposed by Gajewski (2002, 2009). However, according to them, the alternative articulation proposed by Del Pinal (2019, 2022) also faces problems. In particular, it cannot explain the syntactic acceptability of (56) where, they say, we insist on making the two occurrences of the predicate identical, thus leaving no space for meaning modulation.

- 56) This table is red₁ and not red₂ and the property red₁ is identical to the property red₂.

According to this counter-objection, (56) would be irremediably contradictory, since the modulation of the various occurrences of the predicate is blocked, yet grammatical (thus interpretable), and would therefore represent a counterexample to LLH. I see three possible defences against this counter-objection, two on linguistic grounds and one much more philosophical. With regards to the first linguistic defence, it is worth pointing out that the counter-objection rests on the assumption that identity is a logical term. In natural languages, however, sentences concerning identity are not always interpreted as strict identities. In other words, they do not always entail that the pre-copular and the post-copular determiner phrases are co-extensional (Delfitto & Fiorin 2024; *see also* Delfitto & Fiorin 2022).

To appreciate the point, let's first consider cases like (57): binding is infelicitous when the sentence is interpreted as strict identity.

57) *John_i **is** his_i cook (Giorgi & Longobardi 1991).

However, in a context supporting asymmetric identification, as in (58), binding becomes grammatical.

58) This is a non-cooperative household; just as I_i **am** my_i maid, John_j **is** his_j cook (Richardson & Chametzky 1985).

Interestingly enough, a lexically realised predicate of identity does not even require a licensing context to be felicitous. Indeed, we don't need a context to understand that, according to (59), Anne is not strictly identical to her mother.²⁴

59) Anne_i **is identical to** her_i mother (Delfitto & Fiorin 2024).²⁵

As a result, (56) does not seem too problematic after all, even if the modulation of *red* were blocked. However—and this leads to the second linguistic defence, is modulation really blocked? In (56) the two occurrences of the predicate are bound in a purely discursive manner, which does not seem sufficient to force their identity (even if one were to consider identity a logical term). If the sentence were submitted to a speaker to gather her insights, what would she see? Would she see (56), complete with subscripts, or would she see (60)? Both sentences seem extravagant, the former because it uses notations that the ordinary speaker is not accustomed to, the latter because it expresses a rather odd dis-

²⁴ Similar cases support the claim that, for natural languages, we should speak of a logic of asymmetric identification rather than a logic of symmetric identity (Delfitto & Fiorin 2024).

²⁵ This exact example actually comes from a presentation on the topic of binding in copular sentences that the Authors gave at the 49th *Incontro di Grammatica Generativa*. The discussion in Delfitto & Fiorin (2024) supports the same point, though with different examples.

course—not insofar as it is contradictory, but insofar as it has an extension, with respect to (61), that seems entirely superfluous.

- 60) This table is red and not red and the property red is identical to the property red.
 61) This table is red and not red.

We may try to connect the two occurrences in other ways. For example, the continuation “*and the property x_1 is identical to the property x_2* ” may be avoided by using synonyms. In (62) the two predicates are synonymous and, *prima facie*, the sentence might really seem contradictory.

- 62) This table is handcrafted and not handmade.

However, it is not that easy to find two perfect synonyms. In general, an alternative term may have a different flavour (e.g., *handmade* might have a pejorative connotation) or it may have a slightly different extension (e.g., only some bald persons are glabrous). Moreover, even if two perfect synonyms were found, meaning modulation could, in principle, still occur (although I have some reservations as to whether the mere possibility of applying Rescale, irrespective of the concrete chance of obtaining an informative sentence, counts as a proper defence of logicity—but this is a topic for another paper).

Or we may try to connect the two occurrences via pseudowords, like in (63):

- 63) This table is blum and not vrum and the property blum is identical to the property vrum.

In this case, the continuation “*and the property x_1 is identical to the property x_2* ” is needed for the speaker to know something about the pseudowords. Nevertheless, what was said above with regards to the predicate of identity still holds: it does not necessarily entail that *blum* and *vrum* are co-extensional, therefore there is space for the contradiction to dissolve.

All of the above leads us to the last point, which is of a philosophical nature. As much as the principle of non-contradiction may seem to be immediately graspable,²⁶ putting it into words requires ingenuity. Aristotle himself phrases it as follows: «It is impossible for the same attribute at once to belong and not to belong to the same thing and in the same relation; *and we must add any further qualifications that may be necessary to meet logical objections*» (*Metaphysics*,

²⁶ Aristotle speaks of it as «[a] principle that is the most certain of all principles» and as «an ultimate belief; for it is by nature the starting-point of all the other axioms as well» (*Metaphysics*, Gamma, III, 9(12); 12).

Gamma, III, 9(12); emphasis added). Obtaining a contradiction is not as easy as expected.²⁷

7. Conclusion

From the above we can draw, for a start, a moderate conclusion. Even though the syntactic unacceptability of the examples considered depended on a type mismatch, as the typological explanation holds, it has to be acknowledged that what makes this compositional failure special is a context-invariant logical meaning. As a result, the logicity of language hypothesis is not defeated, but at most redefined.

However, those who shy away from moderation can rest easy. In fact, there is room to draw a stronger conclusion and thus unbalance in favour of (a non-reformulated) language logicity, which, albeit with aspects still to be clarified, currently remains the option with the greatest explanatory capacity.

In any case, the typological explanation raises criticisms that language logicity cannot ignore. In particular, it is true that the examples discussed in the literature to defend it are mysterious and it is difficult to say what they actually mean. An expert can formalise them, but an ordinary speaker who had to paraphrase them would find it incredibly difficult. For the typological explanation, this is because the meanings of their components cannot be put together coherently; whilst for logicity it is because they are systematically trivial. All this suggests that the matter, far from being settled, still needs to be addressed in order to resolve all the pending issues, one way or another.

REFERENCES

- Abelard, P. (1970). *Dialectica: First Complete Edition of the Parisian Manuscript*, Assen, Van Gorcum & Comp.
- Abrusán, M. (2007a). *Contradiction and Grammar: The Case of Weak Islands* [Doctoral dissertation, MIT]. <https://semanticsarchive.net/Archive/mI3M2ZiY/abrusan.Contradiction%20and%20Grammar%20The%20case%20of%20weak%20islands.dissertation.pdf>
- Abrusán, M. (2007b). *Even and Free Choice Any* in Hungarian. *Sinn und Bedeutung*, 11, 1–15.
- Abrusán, M. (2014). *Weak Island Semantics*. Oxford University Press.
- Abrusán, M., Asher, N., de Cruys, T. V. (2018). Content vs Function Words: The View From Distributional Semantics. *Proceedings of Sinn und Bedeutung*, 22.
- Abrusán, M. (2019). Semantic Anomaly, Pragmatic Infelicity, and Ungrammaticality. *Annual Review of Linguistics*, 5(1), 329–351.

²⁷ I am indebted to Paul Dekker for this observation.

- Abrusán, M., Asher, N. Van de Cruys, T. (2021). Grammaticality and Meaning Shift. In G. Sagi, J. Woods (Eds.), *The Semantic Conception of Logic* (pp. 249–276). Cambridge University Press.
- Aristotle (H. Tredennick, Trans.). (1933). *Μετὰ τὰ φυσικά* [The Metaphysics, IV]. Harvard University Press.
- Asher, N. (2011). *Lexical Meaning in Context: A Web of Words*. CUP.
- Asher, N., van de Cruys, T., Bride, A., Abrusán, M. (2016). Integrating Type Theory and Distributional Semantics: A Case Study on Adjective-Noun Compositions. *Computational Linguistics*, 42(4), 703–725.
- Bach, K. (1999). The Semantics Pragmatics Distinction: What it is and Why it matters. In K. Turner (Ed.), *The Semantics-Pragmatics Interface from Different Points of View* (pp. 65–84). Elsevier.
- Baker, C. L. (1970). Double Negation. *Linguistic Inquiry*, 1(2), 169–187.
- Bard, E. G., Robertson, D., Sorace, A. (1996). Magnitude Estimation of Linguistic Acceptability. *Language*, 72(1), 32–68.
- Barker, C. (2018). Negative Polarity as Scope Marking. *Linguistics and Philosophy*, 41(5), 483–510.
- Barton, G. E., Berwick, R. C., Ristad, E. S. (1987). *Computational Complexity and Natural Language*. MIT Press.
- Barwise, J., Cooper, R. (1981). Generalized Quantifiers and Natural Language. *Linguistics and Philosophy*, 4(2), 159–219.
- Bonnay, D. (2008). Logicality and Invariance. *Bulletin of Symbolic Logic*, 14(1), 29–68.
- Carston, R. (1997). Enrichment and Loosening: Complementary Processes in Deriving the Proposition Expressed? *Linguistische Berichte*, 8, 103–127.
- Carston, R. (2002). *Thoughts and Utterances: The Pragmatics of Explicit Communication*. Blackwell.
- Chierchia, G. (2004). Scalar Implicatures, Polarity Phenomena and the Syntax/Pragmatics Interface. In A. Belletti (Ed.), *Structures and Beyond* (pp. 39–103). Oxford University Press.
- Chierchia, G. (2006). Broaden Your Views: Implicatures of Domain Widening. *Linguistic Inquiry*, 37(4), 535–590.
- Chierchia, G. (2013). *Logic in Grammar: Polarity, Free Choice, and Intervention*. Oxford University Press.
- Chierchia, G. (2021). On Being Trivial: Grammar vs. Logic. In G. Sagi, J. Woods (Eds.), *The Semantic Conception of Logic* (pp. 227–248). CUP.
- Chomsky, N. (1957). *Syntactic Structures*. Mouton & Co.
- Chomsky, N. (1965). *Aspects of the Theory of Syntax*. MIT Press.
- Chomsky, N. (1976). Conditions on Rules of Grammar. *Linguistic Analysis*, 2(4), 303–351.
- Chomsky, N. (1995). *The Minimalist Program*. MIT Press
- Coulson, S., Kutas, M. (1998). Expect the Unexpected: Event-Related Brain Response to Morphosyntactic Violations. *Language and Cognitive Processes*, 13(1), 21–58.

- Crníc, L. (2011). *Getting Even* [Doctoral dissertation, MIT].
- Davidson, D. (1997). Truth and Meaning. In P. Ludlow (Ed.), *Readings in the Philosophy of Language*. MIT Press.
- Dayal, V. (1996). *Locality in WH Quantification*. Kluwer Academic Publishers.
- Dayal, V. (1998). Any as Inherently Modal. *Linguistics and Philosophy*, 21(5), 433–476.
- Delfitto, D., Fiorin, G. (2022). Inside Names: A Contextualist Approach to the Syntax and Semantics of Direct Reference. *Evolutionary Linguistic Theory*, 4(2), 153–190.
- Delfitto, D., Fiorin, G. (2024). Copular Structures and Asymmetric Identity. *Studia Linguistica*, 79(1), 180–214.
- Del Pinal, G. (2019). The Logicality of Language: A New Take on Triviality, “Ungrammaticality”, and Logical Form. *Noûs*, 53(4), 785–818.
- Del Pinal, G. (2022). The Logicality of Language: Contextualism vs. Semantic Minimalism. *Mind*, 131, 381–427.
- Fauconnier, G. (1975). Polarity and the Scale Principle. *Chicago Linguistic Society*, 11, 188–199.
- Fauconnier, G. (1978). Implication Reversal in a Natural Language. In *Formal Semantics and Pragmatics for Natural Languages* (pp. 289–301).
- Feferman, S. (1999). Logic, Logics, and Logicism. *Notre Dame Journal of Formal Logic*, 40(1), 31–54.
- Ferreira, F., Patson, N. D. (2007). The ‘Good Enough’ Approach to Language Comprehension. *Language and Linguistics Compass*, 1(1–2), 71–83.
- Fodor, J. D. (1979). *A New Logic for Negation* [Unpublished manuscript]. University of Connecticut.
- Fox, D. (2006). *Free Choice and the Theory of Scalar Implicatures*. [Unpublished manuscript]. MIT.
- Fox, D., Hackl, M. (2006). The Universal Density of Measurement. *Linguistics and Philosophy*, 29(5), 537–586.
- Gajewski, J. (2002). *L-Analyticity and Natural Language*. [Unpublished manuscript]. MIT.
- Gajewski, J. (2008a). More on Quantifiers in Comparative Clauses. In J. Gajewski, T. Friedman, S. Ito (Eds.), *Proceedings of the 18th Semantics and Linguistic Theory Conference (SALT 18)* (pp. 340–357). Cornell University.
- Gajewski, J. (2008b). NPI Any and Connected Exeptive Phrases. *Natural Language Semantics*, 16(1), 69–110.
- Gajewski, J. (2009). *L-Triviality and Grammar* [Handout]. UConn Logic Group.
- García-Álvarez, I. (2003). Quantifiers in Exeptive NPs. In G. Garding, M. Tsujimura (Eds.), *Proceedings of the XXII West Coast Conference in Formal Linguistics* (pp. 207–216). Cascadilla Press.
- García-Carpintero, M. (2004). Logical Form: Syntax and Semantics. In A. Coliva, E. Picardi (Eds.), *Wittgenstein Today* (pp. 63–87). Il Poligrafo.
- Giannakidou, A. (1998). *Polarity Sensitivity as (Non)Veridical Dependency*. Benjamins.

- Giannakidou, A. (1999). Affective Dependencies. *Linguistics and Philosophy*, 22(4), 367–421.
- Giannakidou, A. (2002). Licensing and Sensitivity in Polarity Items: From Downward Entailment to (Non)Veridicality. *Proceedings of CLS 39*, 29–53.
- Giannakidou, A. (2011). Negative and Positive Polarity Items. In C. Maienborn, K. von Stechow, P. Portner (Eds.), *Semantics: An International Handbook of Natural Language Meaning* (pp. 1660–1712). Mouton de Gruyter.
- Giorgi, A., Longobardi, G. (1991). The Syntax of Noun Phrases: Configuration, Parameters and Empty Categories. *Cambridge Studies in Linguistics*, 57.
- Grice, P. (1989). *Studies in the Way of Words*. Harvard University Press.
- Groenendijk, J., Stokhof, M. (1984). *Studies on the Semantics of Questions and the Pragmatics of Answers* [Doctoral dissertation, University of Amsterdam].
- Guerzoni, E. (2003). *Why Even Ask? On the Pragmatics of Questions and the Semantics of Answers*. [Doctoral dissertation, MIT].
- Haida, A., Trinh, T. (2020). Zero and Triviality. *Glossa: A Journal of General Linguistics*, 5(1), 1–14.
- Halle, M., Marantz, A. (1993). Distributed Morphology and the Pieces of Inflection. In K. Hale, S. J. Keyser (Eds.), *The View From Building 20: Essays in Linguistics in Honour of Sylvain Bromberger* (pp. 111–176). MIT Press.
- Halle, M., Marantz, A. (1994). Some Key Features of Distributed Morphology. In A. Carnie, H. Harley, T. Bures (Eds.), *Papers on Phonology and Morphology* (pp. 275–288), MIT Press.
- Harris, Z. S. (1954). Distributional Structure. *WORD*, 10(2–3), 146–162.
- Harris, R. A. (1995). *The Linguistics Wars*. Oxford University Press.
- Heim, I. (1987). Where Does the Definiteness Effect Apply? In E. Reuland, A. G. B. ter Meulen (Eds.), *The Representation of (In)Definiteness* (pp. 21–42). MIT Press.
- Hirsch, A. (2016). An Unexceptional Semantics for Expressions of Exception. *U. Penn. Working Papers in Linguistics*, 22(1), 139–148.
- Hoeksema, J. (1987). The Logic of Exceptions. In A. Miller, J. Powers (Eds.), *Proceedings of the 4th Eastern States Conference on Linguistics* (pp. 100–113). Ohio State University.
- Horn, L. (1972). *On the Semantic Properties of the Logical Operators in English* [Doctoral dissertation, University of California].
- Hsieh, I-T. C. (2016). Exhaustification, But-Exceptives, and Any. *Proceedings of Sinn und Bedeutung*, 20.
- Iacona, A. (2018). *Logical Form: Between Logic and Natural Language*. Springer.
- Jacobs, J. (1983). *Fokus und Skalen: Zur Syntax und Semantik von Gradpartikeln im Deutschen*. Niemeyer.
- Jacobson, P. (2005). Variable-Free Semantics: The Case of Quantifier Domain Restrictions [Handout]. Institut Jean-Nicod.
- Kadmon, N. (1987). *On Unique and Non-Unique Reference and Asymmetric Quantification* [Doctoral dissertation, University of Massachusetts].
- Kadmon, N., Landman, F. (1993). Any. *Linguistics and Philosophy*, 16(4), 353–422.

- Kamas, E. N., Reder, L. M., Ayers, M. S. (1996). Partial Matching in the Moses Illusion: Response Bias Not Sensitivity. *Memory & Cognition*, 24(6), 687–699.
- Klima, E. S. (1964). Negation in English. In J. A. Fodor, J. Katz (Eds.), *The Structure of Language* (pp. 246–323). Prentice Hall.
- Krifka, M. (1990). Polarity Phenomena and Alternative Semantics. *Proceedings of the 7th Amsterdam Colloquium*, 277–301.
- Krifka, M. (1991). A Compositional Semantics for Multiple Focus Constructions. In S. Moore, A. Z. Wyner (Ed.), *Proceedings of SALT 1* (pp. 127–158). CLC Publications.
- Krifka, M. (1992). Some Remarks on Polarity Items. In D. Zaefferer (Ed.), *Semantic Universals and Universal Semantics* (pp. 150–189). Foris.
- Krifka, M. (1995). The Semantics and Pragmatics of Polarity Items. *Linguistic Analysis*, 25, 209–257.
- Kripke, S. A. (1980). *Naming and Necessity*. Harvard University Press.
- Kuno, S., Takami, K. (1997). Remarks on Negative Islands. *Linguistic Inquiry*, 28, 553–576.
- Kutas, M., Federmeier, K. D. (2011). Thirty Years and Counting: Finding Meaning in the N400 Component of the Event-Related Brain Potential (ERP). *Annual Review of Psychology*, 62, 621–647.
- Kutas, M., Hillyard, S. A. (1980). Reading Senseless Sentences: Brain Potentials Reflect Semantic Incongruity. *Science*, 207, 203–205.
- Kutas, M., Hillyard, S. A. (1983). Event-Related Brain Potentials to Grammatical Errors and Semantic Anomalies. *Memory & Cognition*, 11, 539–50.
- Kutas, M., Hillyard, S. A. (1984). Brain Potentials During Reading Reflect Word Expectancy and Semantic Association. *Nature*, 307, 161–63.
- Ladusaw, W. A. (1979). *Polarity Sensitivity as Inherent Scope Relations* [Doctoral dissertation, University of Texas at Austin].
- Ladusaw, W. A. (1980a). On the Notion Affective in the Analysis of Negative Polarity Items. *Journal of Linguistic Research*, 1, 1–16.
- Ladusaw, W. A. (1980b). *Polarity Sensitivity as Inherent Scope Relations*. Garland.
- Ladusaw, W. A. (1983). Logical Form and Conditions on Grammaticality. *Linguistics and Philosophy*, 6, 373–92.
- Lahiri, U. (1998). Focus and Negative Polarity in Hindi. *Natural Language Semantics*, 6(1), 57–123.
- Langacker, R. (1990). *Concept, Image, and Symbol: The Cognitive Basis of Grammar*. Mouton de Gruyter.
- Lasnik, H. (1972). *Analyses of Negation in English* [Doctoral dissertation, MIT].
- Lee, Y. S., Horn, L. (1994). *Any as Indefinite Plus Even* [Unpublished manuscript]. Yale University.
- Leivada, E., Westergaard, M. (2020). Acceptable Ungrammatical Sentences, Unacceptable Grammatical Sentences, and the Role of the Cognitive Parser. *Frontiers in Psychology*, 11, 1–9.
- Linebarger, M. C. (1980). *The Grammar of Negative Polarity* [Doctoral dissertation, MIT].

- Linebarger, M. C. (1987). Negative Polarity and Grammatical Representation. *Linguistics and Philosophy*, 10(3), 325–387.
- Linebarger, M. C. (1991). Negative Polarity as Linguistic Evidence. *Papers From the Parasession on Negation CLS 27*, 165–188.
- Magidor, O. (2013). *Category Mistakes*. Oxford University Press.
- Martí, L. (2006). Unarticulated Constituents Revisited. *Linguistics and Philosophy*, 29(2), 135–166.
- May, R. (1977). *The Grammar of Quantification* [Doctoral dissertation, MIT].
- Montague, R. (1970a). English as a Formal Language. In B. Visentini et al. (Eds.), *Linguaggi nella Società e nella Tecnica*, Milano, Edizioni di Comunità, 189–224; reprinted in R.H. Thomason (ed.), 1974, *Formal Philosophy. Selected Papers of Richard Montague*, New Haven, Yale University Press, 188–221.
- Montague, R. (1970b). Pragmatics and Intensional Logic. *Synthese*, 22, 68–94; reprinted in R.H. Thomason (ed.), 1974, *Formal Philosophy. Selected Papers of Richard Montague*, New Haven, Yale University Press, 119–147.
- Montague, R. (1970c). «Universal Grammar. *Theoria*, 36, 373–398; reprinted in R.H. Thomason (ed.), 1974, *Formal Philosophy. Selected Papers of Richard Montague*, New Haven, Yale University Press, 7–27.
- Montalbetti, M. (1984). *After Binding: On the Interpretation of Pronouns* [Doctoral dissertation, MIT].
- Oshima, D. Y. (2006). On Factive Islands: Pragmatic Anomaly vs. Pragmatic Infelicity. *Proceedings of the Annual Conference of the Japanese Society for Artificial Intelligence*, 147–161.
- Osterhout, L., Kim, A., Kuperberg, G. R. (2012). The Neurobiology of Sentence Comprehension. In M. Spivey, M. Joannisse, K. McRae (Eds.), *The Cambridge Handbook of Psycholinguistics* (pp. 365–389). CUP.
- Otero, C. (1972). Acceptable Ungrammatical Sentences in Spanish. *Linguistic Inquiry*, 3, 233–242.
- Partee, B. H. (1987). Noun Phrase Interpretation and Type-Shifting Principles. In J. Groenendijk, D. de Jong & M. Stokhof (Eds.), *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers* (pp. 115–143). Foris Publications.
- Peters, S., Westerståhl, D. (2023). The Semantics of Exceptives. *Linguistics and Philosophy*, 46, 197–235.
- Pistoia-Reda, S., San Mauro, L. (2021). On Logicality and Natural Logic. *Natural Language Semantics*, 29(3), 501–506.
- Pistoia-Reda, S., Sauerland, U. (2021). Analyticity and Modulation: Broadening the Rescale Perspective on Language Logicality. *International Review of Pragmatics*, 13(1), 1–13.
- Park, H., Reder, L. M. (2004). Moses Illusion: Implication for Human Cognition. In R. F. Pohl (Ed.), *Cognitive Illusions: A Handbook on Fallacies and Biases in Thinking, Judgment, and Memory* (pp. 275–292). Psychology Press.

- Putnam, H. (1975). The Meaning of ‘Meaning’. In K. Gunderson (Ed.), *Language, Mind and Knowledge* (Minnesota Studies in the Philosophy of Science, Vol. 7, pp. 131–193). University of Minnesota Press.
- Quine, W. (1960). *Word and Object*. MIT Press.
- Recanati, F. (2010). *Truth-Conditional Pragmatics*. Oxford University Press.
- Reder, L. M., Kusbit, G. W. (1991). Locus of the Moses Illusion: Imperfect Encoding, Retrieval, or Match? *Journal of Memory and Language*, 30, 385–406.
- Richardson, J., Chametzky, R. (1985). A String Based Reformulation of C-Command. *NELS 15*, 332–361.
- Rooth, M. (1985). *Association With Focus* [Doctoral dissertation, University of Massachusetts at Amherst].
- Rooth, M. (1992). A Theory of Focus Interpretation. *Natural Language Semantics*, 1, 75–117.
- Ryle, G. (1949). *The Concept of Mind*. Peregrine.
- Sagi, G. (2018). Logicality and Meaning. *The Review of Symbolic Logic*, 11(1), 1–27.
- Sauerland, U. (2014). Making Fuzzy Logic Work for Language. *Semantics and Philosophy in Europe*, 7.
- Sbardolini, G. (2024). NPIs Are Not Harmonious [Handout]. MLC Seminar, ILLC.
- Sher, G. (1991). *The Bounds of Logic*. MIT Press.
- Simonenko, A. (2015). Semantics of DP Islands: The Case of Questions. *Journal of Semantics*, 33(4), 661–702.
- Sperber, D., Wilson, D. (1986a). *Relevance: Communication and Cognition* (1st ed.). Blackwell.
- Sperber, D., Wilson, D. (1986b). Loose Talk. *Proceedings of the Aristotelian Society*, 86, 153–171.
- Sprouse, J. (2007). Continuous Acceptability, Categorical Grammaticality, and Experimental Syntax. *Biolinguistics*, 1, 123–134.
- Stalnaker, R. (1970). Pragmatics. *Synthese*, 22, 272–289.
- Stanley, J. (2000). Context and Logical Form. *Linguistics and Philosophy*, 23(4), 391–434.
- Stern, J. (2000). *Metaphor in Context*. MIT Press.
- Stern, J. (2006). Metaphor, Literal, and Literalism. *Mind and Language*, 21(3), 243–279.
- Szabolcsi, A., Zwarts, F. (1993). Weak Islands and an Algebraic Semantics for Scope Taking. *Natural Language Semantics*, 1(3), 235–284.
- Tarski, A., Givant, S. R. (1988). *A Formalization of Set Theory Without Variables*. American Mathematical Society.
- Townsend, D., Bever, T. G. (2001). *Sentence Comprehension: Integration of Habits and Rules*. MIT Press.
- van Benthem, J. (1984). Questions About Quantifiers. *Journal of Symbolic Logic*, 49, 443–466.
- van Benthem, J. (1989). Logical Constants Across Varying Types. *Notre Dame Journal of Formal Logic*, 30(3), 315–342.

- van Benthem, J. (2002). Invariance and Definability: Two Faces of Logical Constants. Essays in Honor of Sol Feferman. In W. Sieg, R. Sommer, C. Talcott (Eds.), *Reflections on the Foundations of Mathematics* (ASL Lecture Notes in Logic, Vol. 15, pp. 426–446).
- Van Rooy, R. (2003). Negative Polarity Items in Questions: Strength as Relevance. *Journal of Semantics*, 20(3), 239–273.
- von Fintel, K. (1993). Exceptive Constructions. *Natural Language Semantics*, 1(2), 123–148.
- von Fintel, K. (1999). NPI Licensing, Strawson Entailment, and Context Dependency. *Journal of Semantics*, 16(2), 97–148.
- Wittgenstein, L. (1921). *Logisch-Philosophische Abhandlung* [*Tractatus logico-philosophicus*]. Kritische Edition (1989), B. McGuinness, J. Schulte (ed.), Suhrkamp, Frankfurt a.M. (It. tran. A.G. Conte (ed.), *Tractatus logico-philosophicus*, Torino, Einaudi) (abbr. TLP).
- Zucchi, A. (1995). The Ingredients of Definiteness and the Definiteness Effect. *Natural Language Semantics*, 3(1), 33–78.
- Zwarts, F. (1995). Nonveridical Contexts. *Linguistic Analysis*, 25(3–4), 286–312.
- Zwarts, F. (1998). Three Types of Polarity. In F. Hamm, E. Hinrich (Eds.), *Plurality and Quantification* (Vol. 69, pp. 177–238). Springer.