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On the role of person in the mapping of syntactic features onto their interpretable counterparts

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Abstract

Person features play a role in narrow-syntax processes. However, a person feature is often characterized as [±participant], a characterization that suggests pragmatic or semantic features. Relatedly, person has been the subject of an ongoing debate in the literature: one family of approaches argues that 3rd person is an elsewhere case, while another argues that it is a valued interpretable feature. This article provides a programatic argument that this disagreement has a principled basis. I argue that the representation of the features we identify as person changes between narrow syntax and the syntax-semantics interface. The tests and empirical descriptions are incongruent because they target different modules of the grammar and in turn different grammatical objects. The article thus contributes to our understanding of the division of labour among the modules, with a special focus on the autonomous status of narrow syntax.

Keywords: person, syntax-semantics interface, φ-features, locality, agreement, autonomous syntax

Résume

Les traits de personne jouent un rôle dans les processus purement syntaxiques. Pourtant, un trait de personne est souvent caractérisée par [±participant], ce qui suggère des propriétés pragmatiques ou sémantiques. De même, la personne a fait l'objet d'un débat persistant dans la littérature: une famille d'approches affirme que la troisième personne est un cas défaut et l'autre fait valoir qu'il s'agit d'un trait interprétable spécifié. Cet article fournit un argument programmatique selon lequel ce désaccord repose sur des principes. Je soutiens que la

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représentation des traits de personne varie entre la syntaxe étroite et l'interface syntaxe-sémantique. Si les diagnostics et les descriptions empiriques semblent incohérents, c'est qu'ils ciblent différents modules de la grammaire, et donc différents objets grammaticaux. L'article contribue donc à notre compréhension de la division du travail entre modules, en mettant l'accent sur le statut autonome de la syntaxe étroite.

Mots clés: personne, interface syntaxe-sémantique, traits φ, localité, accord, syntaxe autonome

1. Introduction

Person features play a role in processes that clearly belong to the narrow syntax, such as Case checking (e.g., Anagnostopoulou 2003, Rezac 2004). However, person features interact with animacy, and the features themselves are often characterized as [±participant], [±author] etc. (Ormazabal and Romero 1998, Nevins 2007, Lochbihler and Oxford 2015, Wiltschko and Ritter 2015, Harbour 2016), a characterization that suggests pragmatic or semantic features instead of prima facie narrow-syntax notions. Even more explicitly, Harbour (2016), in an empirically rich account of cross-linguistic variation in the domain of person, argues that person is subject to a semantic rule of composition. In addition, there is an ongoing debate as to whether 3rd person is a valued feature or the absence of a person feature altogether. Upon closer examination we see, however, that authors who argue for 3rd person being syntactically absent (e.g., Anagnostopoulou 2005, Bobaljik 2008, Kayne 2010) consider only morpho-syntactic phenomena. In contrast, authors who argue for 3rd person having a valued person counterpart base their argument on phenomena that target properties that interact with interpretive notions, such as animacy (e.g., Ormazabal and Romero 1998, Nevins 2007, Lochbihler and Oxford 2015). To give a concrete example, Bobaljik (2008) demonstrates that the typology of person pronouns, that is, the number of distinct morphological forms per paradigm attested across a variety of distinct languages is smaller than predicted by a system in which a 3rd person feature is a value relevant for morphological realization. Instead, a system without a 3rd person feature predicts the exact distribution of morphological forms we find. However, Harbour (2016), who focuses on the available interpretations of feature combinations within the pronominal domain, argues that the 3rd person, or more precisely, the corresponding participant features, must enter the computation of number related to person. Thus, while at least some instances of 3rd person features appear to be invisible to the morphology module, they appear to be operational at LF.

This article provides a programatic argument that the disagreement in the literature has a principled basis. I argue that the representation of the features we identify as person changes between narrow syntax and the syntax-semantics interface. The tests give different results because they target different modules of the grammar and thus different grammatical objects. That is to say, while 3rd person can be a default or underspecified value for the purposes of the morpho-syntactic computation, and thus be effectively invisible for a morphological realization, 3rd person is eventually semantically interpreted as a discourse participant, and as such requires a

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representation visible to LF. The surprising behaviour that has become the subject of much recent work on the nature of person becomes less exceptional once we take the dual representation of person seriously.

The idea that the notion of person corresponds to two different entities is not new. Jespersen (1924) argues that it is empirically necessary to distinguish between 'notional' and 'grammatical' person, and this core insight underlies much recent work on the nature of interpretability of φ-features (Wechsler and Zlatić 2000), or formal and interpretive dissociation observed in so-called imposters (e.g., Collins and Postal 2012). This article develops this core insight by providing a formal account of why and how this dissociation arises, and what diagnostics can be used to separate the two types of representation: the narrow-syntax representation akin to purely formal valued or unvalued person features, and the LF-legible representation akin to semantically interpretable [±participant, ±author, …] features.

Several authors have recently proposed that the person feature is a special feature in that it requires 'licensing' at the syntax-semantics interface and that the licensing is modulated by a phase head (e.g., Ritter and Wiltschko 2014, Zubizarreta and Pancheva 2017, Pancheva and Zubizarreta 2018, Kučerová 2018). For example, Zubizarreta and Pancheva (2017), and Pancheva and Zubizarreta (2018) explore Ritter and Wiltschko's claim that languages utilize different grammatical features for semantic anchoring; that is to say, tying the abstract information computed within a phase to an anchored semantic object, such as a possible world or a semantic situation. Some languages, such as English, anchor the compositional semantics of an event built at the vP level by a valued tense feature (for instance, an event of Mary giving a gift to Paula can be anchored by a past tense feature to temporally precede the time of the utterance). Other languages, such as Paraguayan Guaraní, anchor such an event with respect to discourse participants, such as the speaker. For example, in the giving event described above, the event participants would be coded as [−participant] with respect to the situation of the utterance.

This intuitive understanding of the concept of semantic anchoring will suffice for our purposes, as the empirical core of this article focuses on a particular subset of the problem: namely, the relation between a person feature and a semantic index within a DP. In line with the literature on anchoring, I take person to be a privileged feature in the process of mapping a narrow-syntax representation onto the syntax-semantics interface. Specifically, I follow Kučerová (2018) in assuming a formal connection between person and semantic index (for a related insight see, e.g. Longobardi 2008, Landau 2010, Sudo 2012). Note also the long tradition of associating D with a referential index: D has been analyzed as a head that changes a predicate-denoting NP into an individual-denoting structure, or as the source of a referential index itself (e.g., Williams 1981, Higginbotham 1985, Grimshaw 1990, Wiltschko 1998, Winter 2000, Borer 2005, Longobardi 2008, Landau 2010). The primary purpose of semantic indices is to track participants in a discourse (in the sense of Heim's 1982 file-card semantics).

Crucially, a semantic index is not a narrow-syntax object. Instead, a semantic index is an LF object that refers to narrow-syntax features (Minor 2011, Sudo 2012). Technically, a semantic index associated with a DP is a complex structure

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built around a person feature, a numerical identifier, and optionally other φ-features. However, not every person feature comes to be associated with a semantic index. Even definite DPs can function semantically as predicates, as, for example, in copular clauses or construct states (Rothstein 2012). I argue that only a semantically licensed person feature receives a semantic index. The question is what exactly semantic licensing is and how a semantic index becomes part of the syntactic representation accessible to LF.

It follows from the the Y-model of grammar and phase theory (Chomsky 1995, 2000, 2013, 2015) that for a feature to be licensed by the syntax-semantics interface, the licensing must happen during spell-out, since spell-out is the only point in the derivation where narrow syntax and the interface directly interact. I technically implement the intuitive notion of semantic licensing as part of the labelling of a phase by the syntax-semantics interface (Narita 2011; Chomsky 2013, 2015). That is, the phase is identified with a set of features for the purposes of further syntactic derivation and externalization. Semantic licensing of person can then be understood as an interface process that associates a syntactic person feature with a semantic index. The association process is parallel to feature-adjustment processes at the morphology-syntax interface that make narrow-syntax features realizable by the morphology module, in the sense of Distributed Morphology (Halle and Marantz 1993 and much subsequent work). Here, the association renders a narrow-syntax object – a person feature – legible to LF, and in turn interpretable via the association with a semantic index. Two points are critical here. First, a person feature can be licensed only if it projects to a phase label in narrow syntax,[1] that is to say, narrow syntax is the primary structure-building module. Second, a narrow-syntax person feature in and of itself is uninterpretable; in other words, narrow syntax is autonomous from any interpretable information.

With the semantic licensing of person laid out, it is still not obvious why there should be so much confusion in the existing literature on person. I suggest that the lack of clarity follows from the derivational timing of spell-out. The present proposal utilizes an inherent *asynchrony* of spell-out, as follows. Under the Y-model of grammar, the part of the structure that is sent to the syntax-morphology interface (and is thus no longer accessible to narrow syntax) is strictly distinct from the part of the structure that corresponds to a spell-out domain for the syntax-semantics interface. Since only the complement of the phase head is sent to the syntax-morphology interface, the edge of the phase (the head, the specifier and adjuncts), has been licensed by the syntax-semantics interface as part of labelling, but remains accessible to the narrow-syntax derivation until the next round of spell-out.

The direct consequence of the inherent asynchrony of spell-out is that, in addition to features projected in narrow syntax, the label of the phase also contains

[1]This article only discusses cases where a syntactic notion of projection is sufficient. However, the empirical cases discussed in Zubizarreta and Pancheva (2017) and Pancheva and Zubizarreta (2018) require some form of minimal search. In those cases, there is evidence that not only features projected to the label, but also features at the edge of the phase (i.e., within the head, the specifier and adjuncts), can become part of the licensing process.

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semantically licensed features. Both types of features therefore remain accessible to the next stage of the narrow-syntax computation, that is, the syntax of the next phase. The notion of labelling is crucial here as the label becomes the representational locus of the two types of person features.

This inherent asynchrony creates a non-trivial methodological problem for the investigation of person at the syntax-semantics interface. We primarily base our empirical generalizations on the morphological realizations of the person feature. However, if we take the inherent asynchrony of spell-out and the possibility of feature adjustments at the syntax-semantics interface (semantic licensing) seriously, we cannot tell a priori whether the relevant morphological realization is directly based on the narrow-syntax version of the person feature, or whether the morphology might instead realize the person feature after it has been licensed by the syntax-semantics interface. We thus need precise diagnostics to distinguish between a narrow-syntax person feature and a person feature licensed by the syntax-semantics interface.

Since the timing of spell-out coincides with syntactic locality domains, we can use the different locality properties of narrow-syntax person versus semantically licensed person as reliable diagnostics. That is, we expect a narrow-syntax person to be available for feature checking throughout the narrow-syntax derivation. In contrast, we expect the effects of semantically licensed person to coincide with phases and structures larger than a phase, but never to be observed in a structure smaller than a phase. Once a person feature is semantically licensed, that is, associated with a semantic index, its properties can no longer be distinguished from those of the corresponding index. Consequently, we expect the domains of relations based on a semantic index to coincide with the semantic licensing of person.

Three empirical domains immediately offer themselves to such an investigation: First, the domain of interpretable gender (because of gender presuppositions tied to person features, as in Heim 2008, Sudo 2012, for example); second, semantically based number (because of the role of semantic indices in semantic plurality; see Link 1983, Rullmann 2003); third, binding and coreference (because of the role of coindexing; see Heim 1998; Roelofsen 2008, 2011). Crucially, although these three phenomena clearly have a semantic-licensing component, they also have a narrow-syntax counterpart. Semantically based gender and number can be a goal of the syntactic operation Agree, as in agreement with conjoined nominals. As for binding, although it requires some form of LF licensing, it is based on the narrow-syntax relation of c-command.

If this logic is correct, the current proposal makes a specific prediction about crosslinguistic variation. If we assume that crosslinguistic variation is localized at the level of features (the so-called Borer-Chomsky conjecture), it follows that any crosslinguistic variation in person licensing is expected to simultaneously affect all three domains: interpretable gender, number and binding.

Section 2 discusses in more technical detail the proposed model of mapping the features of narrow syntax onto the interfaces. Section 3 discusses several case studies that support the theoretical distinction between the person feature as a narrow-syntax object, and semantically licensed person as an object that arises at the syntax-semantics interface via the association of a syntactic person feature with a semantic index.

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Section 4 addresses the question of cross-linguistic variation and discusses some open questions raised by the proposal.

2. φ-Features at the interfaces: step by step

Let us start by outlining some basic assumptions about the nature of narrow-syntax derivations and spell-out, in order to have a specific theoretical model against which to discuss the data from the rest of this section. The model will also help to identify features and domains that we expect will be relevant to the discussion.

I assume a model of grammar in which syntax is a fully *autonomous* module, with no operations requiring morphological or semantic information. Under this approach, narrow-syntax φ-features are strictly uninterpretable formal features. Interpretive effects arise only at the syntax-semantics interface, as part of person licensing during labelling and transfer. The logic is parallel to that for the morphological realization of narrow-syntax structures: narrow-syntax features are not marked as to whether they will be morphologically realized. Instead, morphological realization is determined by the syntax-morphology interface.

As for their valuation, φ-features come to the derivation either valued from the lexicon or unvalued. If they are unvalued, and if there is a matching valued feature, they get valued by Agree within narrow syntax. A φ-feature can be valued at the syntax-semantics interface as well, but only if it has not been valued in the narrow syntax, that is, when there is no matching feature from the lexicon. The latter process has been termed valuation from context (Steriopolo and Wiltschko 2010). Consequently, we expect to see semantic feature valuation only at the phase level, while syntactic valuation can take place in a structurally smaller domain.

This theoretical distinction in feature valuation comes with a methodological caveat. Features that are 'visible' in the morpho-phonological realization, which is the only representation we have direct access to, can have become visible in three distinct ways; (a) by mapping of syntactically valued features, (b) by mapping of semantically enriched features; that is, features without a value from narrow syntax but with reference to their corresponding semantically licensed feature (here person, discussed in detail below), or (c) as a morphological default (last resort) realization of unvalued syntactic features, as in Béjar (2003).

If a feature gets valued within narrow syntax, we do not expect to see any interesting interactions in the corresponding minimal spell-out domain. However, if a feature is not valued within narrow syntax, there are two possible outputs: a morphological default, or a feature enriched by the syntax-semantics interface. Following Kučerová (2018) I assume that both of these options can be morphologically realized. It is argued there that morphology can either reflect a minimal spell-out domain (that is, the complement of a phase head spelled out after narrow-syntax operations have been completed), or it can reflect a transferred phase (that is, a phase that has been minimally searched by the syntax-semantics interface (CI), and thereby labelled).

Introducing a derivational ambiguity of this sort might easily lead to overgeneration. We must therefore ensure that the model is sufficiently restricted. A first

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restriction comes from the primacy of syntax, since, if a feature can be valued from narrow syntax, it *must* be valued. We thus expect that the proposed morphological duality should be limited to a fairly small number of cases. A second restriction comes from the syntax-semantics interface. Consider the following example:

(1) The doctor was quite good …

a. He/she was attentive.
b. They were attentive.
c. #It was attentive.

According to Kratzer (2009), among others, a pronoun enters the derivation as a minimal pronoun, which I model as a D consisting of a bundle of unvalued φ-features. Putting aside the technicality of how the valued features are transmitted to the minimal pronoun, the fundamental question is where the valued features come from. If we assume that the root 'doctor' is not stored in the lexicon with three distinct sets of φ-features, then the features realized on the pronoun must be presupposed or accommodatable. The masculine pronoun ('he') introduces two presuppositions: that the doctor is a person and that it is a man. The feminine pronoun ('she') also presupposes a person, but this time a woman. The critical contrast is between (1b) and (1c). The nominal 'doctor' asserts as part of its lexical semantics a person, hence, the common ground established by the linguistics discourse presupposes the antecedent to be a person. Yet biological gender is not encoded in the linguistic discourse. Consequently, the pronoun must morphologically reflect a person ('they' versus 'it') but the speaker can chose whether to accommodate the biological gender as well. The continuation in (1b) then reflects the choice of not accommodating the biological gender (be it for sociological reasons or speaker's ignorance), in contrast to (1a).[2] I argue that what we see in this example is a morphological realization of unvalued features restricted by the Maximize Presupposition principle of Heim (1991).

The original formulation of Maximize Presupposition was meant to regulate a choice of lexical items, namely, the definite versus indefinite article in English. Since this article assumes a realizational morphology, the choice of lexical items can be reformulated as a matter of morphological realizations, and can be straightforwardly extended to the morphological realization of features. Under this view, Maximize Presupposition says that if there is a grammatical form that morphologically marks presuppositions that are satisfied in the given context, that form must be used in preference to one that does not mark the presuppositions. If we apply this principle to the examples in (1), we get a syntactic structure with unvalued φ-features (a minimal pronoun) but the features end up morphologically realized in a way that obeys Maximize Presupposition.

I claim that the application of Maximize Presupposition in (1) is more general, and can affect any unvalued feature, as long as the corresponding feature is

[2]The plural number of 'they' results from an interplay of English not having an animate non-gendered singular pronoun and the fact that plural is semantically unmarked, that is, compatible with denoting a single individual (Sauerland, 2003).

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presupposed. It follows from this that only presuppositional features affect morphological output.

This article is concerned with person as the only syntactic feature from the φ-feature set that requires licensing by the syntax-semantics interface. That is to say, person is a narrow-syntax feature that gets associated with a semantic index. In turn, only presuppositional features associated with person within a semantic index can be semantically enriched, and in turn morphologically realized in the absence of a corresponding valued syntactic feature. The notion of semantic enrichment thus refers only to the morphological realizations of CI-labelled features, not to the syntactic valuation of the corresponding narrow-syntax feature.

3. Case studies

This section discusses several case studies that demonstrate semantic enrichment and its locality domains for gender and number.

3.1 Locality domains in interpretable gender in Italian

Standard Italian has a class of grammatically masculine nouns denoting professions traditionally performed by men, but which are increasingly performed by women, such as *chirurgo* 'surgeon' or *avvocato* 'lawyer'. As a result, these nouns are in the process of changing their grammatical gender representation. More precisely, as argued by Kučerová (2018), they shift from having a lexically specified grammatical masculine gender to a minimal nominal representation without a valued gender feature. This minimal representation then allows a larger level of flexibility with respect to contextually assigned gender.

Let us turn to the data. If such a noun denotes a male referent, agreement with it is strictly masculine, as seen in (2).[3]

(2) Il chirurg-o è andat-o.
the.M surgeon-M is gone-M
'The (male) surgeon is gone.'

In contrast, if such a noun denotes a female referent, native speakers accept three distinct agreement patterns, exemplified in (3).

(3) a. La chirurg-a è andat-a.
the.F surgeon-F is gone-F
'The female surgeon is gone.'

[3]I discuss here the distribution of only those roots that are no longer associated with grammatical gender in the lexicon. For some speakers, however, these roots retain their lexical gender specification. For those speakers, such nouns are masculine throughout and compatible with both biological genders. I do not discuss this grammatically masculine type here as it does not shed any light on the nature of person.

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b. La chirurgo è andat-a.
the.F surgeon is gone-F
'The female surgeon is gone.'

c. Il chirurgo è andat-a.
the.M surgeon is gone-F
'The female surgeon is gone.'

The pattern in (3a) is the expected one. Here, the noun has fully switched to a grammatically feminine gender, and the switch is visible in the nominal form itself. The vocalic ending -a, in contrast to the original masculine -o, indicates a gender-related alternation attested in so-called mating nouns (Harris, 1991), such as *bambino* 'baby' and *bambina* 'baby girl'. Consequently, all agreeing elements both within the extended nominal projection and within the predicate display feminine agreement.

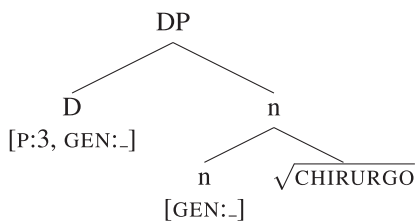
The patterns in (3b) and (3c) are more surprising. Here, the noun itself does not carry a morphological feminine marker, but nonetheless triggers feminine agreement. In (3b) the agreement is feminine throughout. One could thus argue that the final -o on the noun is not a gender marker but a class (declension) marker, and the noun, despite its morphological appearance, is grammatically feminine. The feminine agreement is then regular agreement with this grammatical gender feature.

Under this account, the pattern in (3c) is a mystery. For the predicate to agree in feminine, there must be a feminine feature on the goal, that is, on the DP. However, the determiner itself is masculine.

I claim instead that the pattern results from a syntactically unvalued gender feature that gets its value only at the syntax-semantics interface. If the DP is spelled out before it is labelled by the interface, the unvalued feature on D gets realized as a morphological default, which in Italian is masculine. If, however, the DP is spelled out only after it has been labelled by the syntax-semantics interface, the determiner is morphologically feminine.

Let us consider the derivations in more detail. I assume that D is merged as a bundle of unvalued φ-features and valued person. Since the noun has shifted in its grammatical representation from grammatically masculine to genderless, the root and its corresponding nominalizer (roughly, nP) do have a lexically valued gender feature. Consequently, when D probes for matching φ-features, there is no gender feature on n to value the gender feature on D.

(4) Feature distribution from the lexicon and matching:



If such a DP gets spelled out before it is labelled by the syntax-semantics interface, morphology receives an unvalued gender feature as its input. Since gender must be

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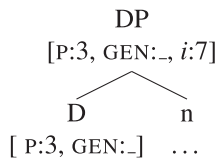
realized on Italian determiners, the system realizes the unvalued gender feature as the morphological default, namely masculine (Thornton, 2001). This derivation yields the apparently masculine nominal in (3c). Crucially, the morphological realization in and of itself does not yield a valuation of the syntactic feature in the label.[4]

However, if the DP is sent to morphology after it has been labelled by the syntax-semantics interface, the unvalued feature can be enriched by presuppositional features associated with the corresponding semantic index, as follows.

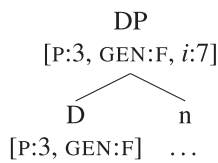
First, a person feature from the phase head (D) projects into the label of the phase. In the next step, when the label is licensed by the syntax-semantics interface as part of spellout, this person feature is associated with a corresponding semantic index. Technically, a semantic index is a variable, interpreted by an assignment function (Heim and Kratzer 1998). Following Minor (2011), Sudo (2012), and Podobryaev (2017), I model a semantic index as a complex structure that contains a reference to presuppositional φ-features. If there is an unvalued φ-feature associated with the person feature in the label, the morphological realization of such an unvalued feature can refer to feature indices within the semantic index, provided that such a morphological realization complies with Maximize Presupposition. In such an instance, morphology realizes the CI-licensed label; more precisely, it spells out the syntactically unvalued instance of CI-licensed person within the edge of the phase. In our example, this means that the determiner is morphologically realized as feminine; that is, we derive the nominal in (3b). The derivation is schematized in (5). *i*:7 corresponds to a semantic index, where 7 is an arbitrary numeral associated with the index.

(5) CI-licensing person in the DP label:

a. Syntactically projected person is CI-licensed and associated with a semantic index:



b. Features affected by presupposition-driven gender realization:



[4]See Béjar (2003) for an extensive argument that features can fail to receive a value in narrow syntax, and yet be realized in morphology as a morphological default.

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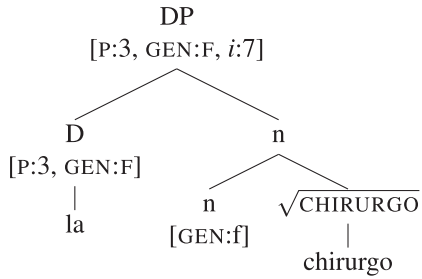
c. Morphological output:



We have successfully derived the two agreement patterns within a DP, corresponding to the nominals in (3b) and (3c). The question now is why the agreement with the predicate is uniformly feminine in both (3b) and (3c). I propose that a DP can become a goal for syntactic Agree only if it has been fully labelled, including labelling by the syntax-semantics interface (see Narita 2011 for an independent argument that some narrow-syntax operations require CI-labelled objects). This means that the valuation of the gender feature on the predicate can take place only after the DP label has been licensed by the syntax-semantics interface, and strictly refers to the CI-licensed value. As within the DP the morphological realization of feminine gender on the predicate is driven by Maximize Presupposition. However, because of the order of operations in the derivation, when the realization of the predication agreement takes place, the presuppositional information is always present. Consequently, predicate agreement in (3b) and (3c) is uniformly feminine, irrespective of the morphological realization of the determiner.

The dual agreement pattern observed in (3b) and (3c) thus results from the interaction of two properties: first, no gender feature valuation takes place in narrow syntax, and second, masculine is a morphological default, not the realization of a valued feature.

This account makes a clear prediction: a local agreement optionality of the sort attested within the extended nominal projection, and exemplified in (3b)–(3c), is possible only if the semantically enriched value differs from the morphological default for the given feature. In particular, morphologically feminine nouns denoting a male referent should not exhibit a dual agreement pattern, because the morphologically feminine agreement within an extended nominal projection cannot be the default realization of an unvalued syntactic gender feature. Instead, the gender feature must have been valued in narrow syntax. Because of primacy of syntax, features valued in narrow syntax take precedence for the content of the phase label. Hence, once the gender feature is valued in the syntax, the syntax-semantics interface cannot 'rewrite' the valued feature in the DP label. Consequently, feminine nouns are predicted to trigger feminine agreement in all local syntactic environments, even if they denote a male referent. This prediction is borne out. In Italian, grammatically feminine nouns such as *guida* 'guide' or *guardia* 'guard' obligatorily trigger feminine agreement on predicates, irrespective of the gender of their referent, as demonstrated in (6) (modelled after Ferrari-Bridgers 2007).

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(6) La brava guarda si e'persa nel bosco
the good guard.F her/him lost.F in the woods
'The good guard lost his/her way in the forest.'

In this section, we have seen an example of a gender interaction mediated by a semantically licensed person value at the syntax-semantics interface. Gender realization attested within the DP phase was always based on valued narrow-syntax features or resulted from default morphological realization. In contrast, contextually driven gender valuation is present only once the phase is fully labelled. This empirical pattern supports the proposed model of grammar architecture in which person originates in the narrow-syntax module and is independent of other φ-features. But when it is semantically licensed by the syntax-semantics interface, presuppositional φ-features can be derived from the licensed person feature, i.e., a person feature associated with a semantic index. This being said, the pattern is quite simple and could have arisen via other derivational means. The remainder of this section investigates more complex interactions, where other theories fall short.

3.2 Locality domains of computing semantic features of a DP coordination

The previous section established our method of investigation. We expect to find interactions in the domain of person and its derived presuppositional φ-features only if the relevant feature cannot be valued in narrow syntax. A feature can remain unvalued either if there is no valued counterpart in the relevant locality domain or, as we will see in this subsection, if the features in the label must be established by the syntax-semantics interface for an independent reason.

Cross-linguistically, coordinate DPs tend to trigger plural agreement even if both conjuncts are grammatically singular. The plural feature thus must arise during the derivation, instead of being supplied from the lexicon. Since Agree can only match and value features, the plural number feature in such a case cannot be derived by Agree in narrow syntax. Note that even under multiple-agree approaches (e.g., Hiraiwa 2005), the goals must match in their value; Agree never composes new values. There is, in fact, rather strong evidence in the literature that the plural of coordination is always semantically based; in other words, the plural corresponds to semantic plurality as a sum of individuals (Munn 1993, Bošković 2009, Bhatt and Walkow 2013.[5]

[5]I assume that the features of a coordinate DP are computed as a combination of morpho-syntactic and semantic features (Farkaş and Zec 1995, King and Dalrymple 2004, Heycock and Zamparelli 2005, among others). Accounts based only on Agree have been proposed (e.g., Marušič et al. 2015). However, as argued in Kučerová (2017), they are empirically inadequate. The argument put forward in Kučerová (2017) relies on a novel observation that in the case of gender mismatch on conjuncts, the feature resolution plays out differently depending on the features of the probe. A complete resolution takes place only if the probing feature is person. If the only probing feature is gender, a variety of agreement clashes and gaps arise, something entirely unexpected under an Agree-based approach. Notably, some proposals that argue for an agree-based approach end up using clearly semantic features. See, for instance, the group-feature addition procedure in Grosz (2015).

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What does this mean for our investigation of person? As (7) demonstrates, in order to know whether a coordination such as 'his best friend and editor' triggers plural or singular agreement, the system must know the 'identity' of the individuals in the coordination. More precisely, each conjunct needs to be associated with a semantic index. If the indices are equal, the agreement is singular. If the indices are distinct, the agreement is plural.

(7) a. his best friend$_i$ and editor$_j$ **is** by his bedside $i = j$

b. his best friend$_i$ and editor$_j$ **are** by his bedside $i \neq j$

Consequently, if a coordination label contains a plural number feature, the coordination must have been labelled by the syntax-semantics interface. If it wasn't, the person features have not yet been semantically licensed. Thus, in a language where agreement with coordination as a semantic plurality can be either singular or plural, we can use plural agreement as a derivational 'time marker'. That is to say, singular agreement should be associated only with coordinations that have not yet been labelled by the syntax-semantics interface, while plural indicates labelling by the syntax-semantics interface. Czech is a language that lends itself to such an investigation.

3.3 Prediction I: Agreement within a coordinate structure

The core assumption here is that a coordination phrase is labelled as plural only if it has been labelled by the syntax-semantics interface, because narrow syntax cannot compose two singular features into a plural feature by the operation of Agree. Recall that Agree can only match and value within the established matching link. Consequently, the plural feature in the label of a coordination phrase must be the result of the labelling of the phrase by the syntax-semantics interface. The plural itself is derived from the coordination of semantic indices associated with a person feature from each of the conjuncts.

If the plural feature arises only when the label is processed by the syntax-semantics interface, that plural feature is not available to any Agree relation that takes place before the phase is completed. We therefore predict that only elements probing after the phase is transferred can reflect the interface-enriched value and exhibit plural agreement. In contrast, elements, such as adjectival adjuncts and determiners, merged within the phase, prior to labelling by the interface can agree with only one of the adjuncts, and never with the whole coordination. The prediction is borne out in Czech. As (8a) demonstrates, adjectival adjuncts must agree with the closest conjunct, whether they modify only the conjunct they agree with or the whole coordination. The same holds for demonstratives, as shown in (8b).

(8) a. *mladí/ ✓mladý muž a žena
young.M.PL/ young.M.SG man.M.SG and woman.F.SG
'a young man and a young woman' OR
'a young man and a woman'

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b. *ti/ ✓ten muž a žena
that.M.PL/ that.M.SG man.M.SG and woman.F.SG
'that man and (a) woman'

Similarly, determiners that semantically require plurality, such as *oba* 'both', cannot be merged within a coordination phrase either, as shown in (9).

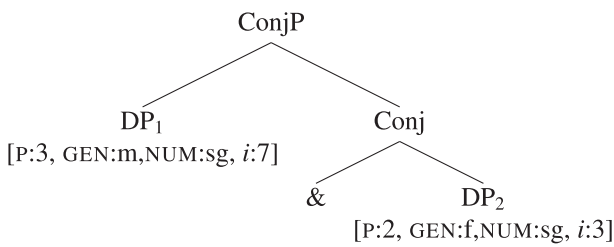
(9) *oba/ *obě kočka a kotě
both.M/ both.F/N.PL cat.F.SG and kitten.N.SG
Intended: 'both cat and kitten'

These two patterns are unexpected under theories that assume that syntax can probe for two goals and compose the plural number value directly from two singular probes. In contrast, the pattern is predicted under the theory proposed here, because plurality is based on semantic indices associated with person features, and is available only after the coordination phrase has been labelled by the syntax-semantics interface.[6]

3.4 Prediction II: Features of a labelled coordination

Let us unpack exactly how the labelling at the level of the coordination phrase works. For the coordination phrase to be labelled, each conjunct must be labelled by the syntax-semantics interface; since the overall coordination refers to a plurality of indices, the individual conjuncts must already be associated with individual indices. For concreteness, let us assume a structure with two DP conjuncts and φ-features as indicated in (10).

(10)



If a coordination phrase must be uniquely labelled, it is not obvious how features project to the label from narrow syntax when the values of relevant features do not

[6]An anonymous reviewer raises a question about semantic plurality for English collective nouns, such as *team* (see Smith 2015), as they display a similar contrast.

(i) a. The committee has/have
b. This/*these committee

The pattern indeed suggests that there are two types of features: narrow-syntax number valued as singular, and semantic plurality derived as part of CI-labelling. However, the facts are more complex. As discussed in Sauerland and Elbourne (2002), the plural agreement with this type of nouns requires LF (covert) movement. Section 3.5 discusses a connection between overt movement and CI-licensed labels, and some of the basic insight extends to the *committee*-type plural agreement. However, a thorough discussion of covert movement and its timing in the connection to labelling goes beyond the scope of this paper.

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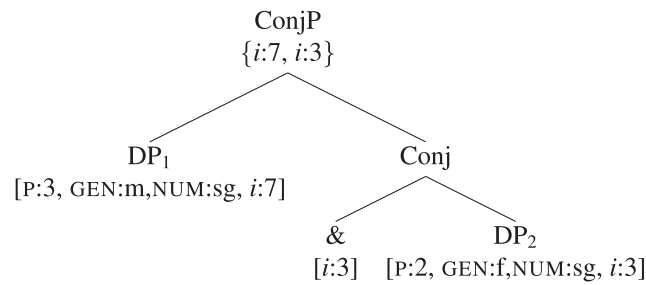
match (here, person and gender). In fact, even when they match, projecting the value of the feature would give an incorrect result. In (10), number would project as singular, not plural. I propose instead that the label of the coordination is based solely on the indices. The coordination head projects a set-forming feature (e.g., a joiner in the sense of Szabolcsi 2015). This syntactic feature becomes part of the label, but needs to be licensed by the syntax-semantics interface (in a fashion parallel to a person feature). As part of this licensing, the set-forming feature searches for locally accessible semantic indices. I assume, following Zubizarreta and Pancheva (2017) that, for the purposes of semantic licensing, the edge of the phase (the head, the specifier and potential adjuncts) forms a local domain. That is, the complement conjunct does not contribute the indexical information directly; rather, the indexical information comes via s-selection features of the conjunction head (with Merge modelled as Agree). The second index feature is then added during minimal search as part of labelling the phase. The indices are then added to the label as part of a set formed by the joiner. The resulting structure is given in (11).[7]

(11)



As argued in section 3.1, a semantic index can be enriched by presuppositional φ-features, based on the person features associated with the index. Such a presuppositional φ-feature is then morphologically realized in accordance with Maximize Presupposition, and it can value unvalued φ-features as part of an Agree chain as well. As for the coordination label, the relevant φ-feature is therefore a plural number feature.

Other φ-features might be associated with a semantic index as well. In section 3.1, the relevant feature was gender. As we saw, the gender feature became morphologically visible only if the gender feature in the label was not valued from syntax. Thus there was a contrast between morphologically masculine nouns that might have been, but were not necessarily, syntactically valued (because masculine is a morphological default in Italian) and feminine nouns that necessarily had their gender feature valued in syntax. Thus nouns like *guarda* 'guard' trigger feminine agreement even if they denote a man.

[7]An anonymous reviewer raises the question of how the system recognizes that [[John] and [Bill's brother]] will form a plural set (or dual), while [[John and Bill]'s brother] will end up being labelled as singular. Briefly, the head of the latter DP is the D associated with 'brother'. The person feature of this D head projects to the DP label and in turn gets associated with a single semantic index. The coordinated DP in the specifier does not project its labelled features to the top of the DP. Thus, only the former structure has a label with two indices.

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I claim that the presuppositional feature is still part of the corresponding semantic index even when it is not morphologically realized on the DP itself (because of the primacy of features valued in narrow syntax). In such a case we expect the presuppositional feature to be detectable in the label of a coordination. The reason is that the label cannot have a valued gender feature from syntax. If there is a gender feature in the label, it must be derived as a presuppositional feature from the semantic index.

Concretely, if an Italian noun that denotes a man comes from the lexicon with a grammatical feminine feature, we predict that such a noun cannot trigger masculine agreement locally, for example on the predicate. This is correct, as we have seen in (6). However, if such a noun is embedded in a coordination, the presuppositional gender feature, here masculine, becomes part of the label because of its association with the semantic index in the label. We therefore expect a predicate agreement with such a coordination to treat the conjunct as masculine, not grammatically feminine. If, however, such a noun denotes a woman, the agreement should treat the noun as feminine. Both predictions are borne out, as shown in (12). Here, the predicate agreement is feminine if both conjuncts denote women, as in (12a), but it is masculine if the noun 'guardia' is interpreted as a man, as in (12b).

(12) a. La guardia e sua sorella sono andate al cinema sta sera.
the guard.F and self sister are gone.F.PL to-the movies this evening
'The (female) guard and her sister went to the movies tonight.'

b. La guardia e sua sorella sono andati al cinema sta sera.
the guard.F and self sister are gone.M.PL to-the movies this evening
'The (male) guard and his sister went to the movies tonight.'
[adapted from Ferrari-Bridgers (2007, 151, (4))]

Note that for reasons of space, this article does not include a careful comparison with existing proposals on gender, such as those of Pesetsky (2013) and Kramer (2015). These proposals introduce two distinct gender features on distinct functional heads (for Pesetsky, as part of the lexical semantics of the head, and for Kramer, as an interpretable syntactic feature) within the same extended nominal projection. However, these proposals cannot account for the connection between locality domains, spell-out, and gender-agreement alternations of the sort seen in (12). Nor can they account for the coordination data discussed in the remainder of this section.

3.5 Prediction III: Agreement with a coordination

As discussed, I exploit the inherent asynchrony of spell-out, which is to say, only the morphologically spelled-out structure (i.e., the complement of a phase head) becomes inaccessible to narrow syntax. The edge of the phase, and more prominently, the phase label – even if already CI-licensed, remains in the derivation until the next round of morphological spell-out. That is, there is a derivational window during which syntax can, but need not, refer to CI-licensed features. We saw in section 3.3 that plural number is not part of the coordination phrase label before the phrase is labelled by the syntax-semantics interface. Yet, there are syntactic features accessible to narrow syntax.

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If the current proposal is on the right track, we expect to see agreement optionality with coordinations. Further, we predict that the optionality should be restricted. More precisely, we expect to see optionality only if the relevant Agree relation could have taken place before the phase – here a coordination phrase – was labelled by the syntax-semantics interface. These predictions are borne out in Czech.[8]

As can be seen in (13), predicate agreement with coordination in Czech is sensitive to the syntactic position of the coordination phrase. If the coordination phrase is in its base-generated position (spec,vP), as in (13a), the predicate can either agree with the first conjunct, or it can agree in plural with the whole coordination. In contrast, if the coordination phrase appears in spec,TP, the predicate agreement can only be plural, as in (13b).[9]

(13) a. Přišel/ přišli Petr a Marie.
came.M.SG/ came.PL Petr.M and Marie.F
'Peter and Mary arrived.'

b. Petr a Marie *přišel/ přišli.
Petr.M and Marie.F came.M.SG/ came.PL
'Peter and Mary arrived.'

I claim that this pattern follows from the current proposal. When the coordination phrase is merged in its base-generated position, it is sufficient for the label to contain only features projected from narrow syntax. The plural number feature (or any other number feature for that matter) is therefore not part of the coordination phrase label. When the predicate probes for a matching number feature, there is no matching feature in the label of the coordination phrase. The probe continues probing. The next closest probe is the gender feature in the label of the structurally higher DP. The resulting agreement is singular. On the other hand, the coordination phrase might have already been labelled by the syntax-semantics interface. If so, the plural number feature derived from the set of indices in the label becomes the closest goal, and the resulting agreement

[8]An anonymous reviewer asks about so-called last-conjunct agreement. Although the evidence for this type of agreement has become robust thanks to two major experimental studies, Marušič et al. (2015) and Willer-Gold et al. (2016), the facts are not entirely clear, nor is there a good theoretical analysis of the last-conjunct agreement facts. As discussed in Kučerová (2017), feature resolution in agreement with coordinations depends on the features of the probe. Furthermore, some authors (the first mention I know of is Toporišič 1976, see also the analysis in Kučerová 2002) argue that last-conjunct agreement is limited to certain predicates (psych verbs and unaccusatives). None of the existing studies controls for these structural factors, making a theoretical account of the data difficult.

[9]An anonymous reviewer points out that the pattern in (13) is reminiscent of agreement facts in *there*-constructions (Munn 1993).

(i) a. There is/are a man and a woman outside.
b. A man and woman are/*is outside.

It is possible that these facts are related. However, as pointed out by Massam (2013), there might be additional structural differences between the singular and plural agreement in (12a) which would make the comparison moot.

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is plural. I claim that for a phase to be moved (i.e., internally merged), it must have been fully labelled by the syntax-semantics interface. Thus, when the coordination phrase raises to spec,TP, the label of the coordination phrase always contains the derived plural feature, and only plural agreement is possible.[10]

This account makes a straightforward prediction. The difference between (13a) and (13b) does not lie in the linear order, nor does it lie in different hierarchical relations. The only relevant factor is whether the coordination phrase has necessarily been labelled by the syntax-semantics interface. If internal merge enforces labelling by the syntax-semantics interface, we expect that a coordination phrase should obligatorily agree in plural whenever it has been internally merged. Plural agreement should be obligatory even if the coordination phrase linearly follows and is c-commanded by the agreeing predicate. This prediction is borne out, for example, when a coordination phrase is the head of an internally headed relative clause. Since such a coordination phrase must have undergone internal merge, the phrase must have been labelled by the syntax-semantics interface. As can be seen in (14), predicate agreement with such a coordination phrase must be plural.

(14) *Přišel/ přišli chlapec a dívka, co je pozvala Marie.
came.M.SG/ came.PL boy.M and girl.F what them invited Marie
'A boy and a girl that were invited by Marie arrived.'

To summarize, in this section we have seen a rather complex set of interactions of number and gender. I have argued that the interactions follow from a model of the grammar in which a person feature becomes associated with a semantic index as part of labelling by the syntax-semantics interface. I have further proposed, following existing literature on presuppositional φ-features, that once a person is associated with a semantic index, such an index can be enriched by presuppositional φ-features. Such an enriched semantic index can in principle contribute to morphological realization, and to agreement. However, this may happen only if the corresponding features have not already been projected to the label within narrow syntax. If there is such a valued feature from narrow syntax, the presuppositional feature cannot be detected in the minimal local domain of the label. Nonetheless, such a feature can contribute a value to a higher label that lacks that feature.

4. Open questions and cross-linguistic variation

Section 3 explored several case studies that demonstrate rather intricate interactions of gender features present in narrow syntax and gender features derived during

[10] An anonymous reviewer raises the question of whether look-ahead might be required in order to ensure that a conjunction phrase is CI-labelled before it can be internally merged. This is a genuine concern. One possible answer is that the conjunction phrase might not have categorial features required for internal merge. For all we know, the conjunction head might be devoid of category specification, and the closest target for internal merge would thus be the first conjunct. However, movement of the first conjunct would yield a coordination island violation. That is to say, internal merge would be possible, but the derivation would crash for other reasons.

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labelling of the nominal phase by the syntax-semantics interface. The person feature plays a crucial role in the cases investigated, as it provides a formal anchoring between narrow syntax (person feature in the narrow-syntax sense) and the syntax-semantics interface (via the association of the person feature with a semantic index, that is to say, the locus of derived presuppositional φ-features). The core insight is that person has a central role in mapping of phases onto the syntax-semantics interface.

The idea is not new. For example, Ritter and Wiltschko (2014), Zubizarreta and Pancheva (2017), and Pancheva and Zubizarreta (2018) propose that a person feature is an anchoring feature, i.e., a feature that anchors an event to a particular situation. More precisely, according to these authors, person anchors speech participants, and in turn, the event they participate in. Crucially, Zubizarreta and Pancheva (2017) and Pancheva and Zubizarreta (2018) argue extensively that such anchoring via person feature is not a universal property of language. Instead, languages differ in which feature is used for anchoring feature (e.g., tense can be an anchoring feature) and on which functional heads the anchoring feature occurs.

If the locus of the person feature and its anchoring properties differ across languages, we expect a range of cross-linguistic variation with respect to the locality properties of presuppositional φ-features. In addition, languages might differ in which domains count as phases. While I have assumed throughout this paper that both DPs and conjoined DPs are phases, the phasehood of DPs has been questioned. For instance, Bošković (2005) and following work proposes that some Slavic languages do not have DP phases, because they might not have the D projection at all. Furthermore, Bošković (2014) proposes that the phasehood of a nominal phrase might vary from structure to structure.

With these caveats in mind, it is difficult to make precise predictions for other languages. Despite this methodological difficulty, the present proposal makes clear predictions about *correlations* between certain phenomena.

The first case to consider is a language in which a person could be labelled by the syntax-semantics interface at an earlier stage of the derivation than in Czech. In such a language, we expect to find derived presuppositional features in a domain smaller than what was identified as a nominal phase in the previous discussion. In such a language, for example, adjectives and determiners might show plural agreement, even if they are merged within a coordination phrase. In addition, even predicate agreement with a local subject could be based on such derived φ-features. A possible candidate for such a language is Russian. Russian indeed allows plural agreement within conjoined DPs, as in (15) (Pavel Koval, p.c.), and Russian predicates can agree with the semantic number feature instead of the grammatically expressed one, as in (16).[11]

[11] As an anonymous reviewer points out, Bosnian/Serbian/Croatian may also be such a language. See the agreement facts discussed in Willer-Gold et al. (2016), and the binding facts discussed in Despić (2011).

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(15) molodye mužčina i ženščina
young.PL man and woman
'a young man and woman'

(16) a. V ètom fil'me igrali [pjat' izvestnyx aktërov].
in this film played.PL five.NOM famous actors.GEN

b. V ètom fil'me igralo [pjat' izvestnyx aktërov].
in this film played.SG five.NOM famous actors.GEN
'Five famous actors played in this film.'

(Pereltsvaig, 2006, 438–439, (3))

Strikingly, Russian shows exceptional behaviour in another domain independently associated with properties of semantic indices, namely binding. As Nikolaeva (2014) discusses, Russian pronouns can bind outside of c-command, although in a restricted domain. Specifically, possessive pronouns in the specifier of a DP can bind outside of their c-command domain, as shown in (17) (Nikolaeva 2014: 8, (2)).

(17) *Eë$_i$ učitel'nica poxvalila Mašu$_i$.
her teacher.NOM praised Maša.ACC
'Her$_i$ teacher praised Maša$_i$.'

According to Nikolaeva's analysis, this is because the index in Russian is able to syntactically raise to the immediately dominating projection. In the framework developed in the present account, index raising corresponds to person raising or differences in the domain of syntax-semantics labelling.

Alternatively, the syntax-semantics interface could associate person with a semantic index only at a later stage of the derivation. In such a language, semantically-based plural marking on nouns would be optional in some structurally restricted circumstances, predicate agreement with plural nouns would be optional and even plural agreement with conjoined phrases would be optional. Brazilian Portuguese is possibly such a language. In addition to having bare singular nouns, as in (18), Brazilian Portuguese exhibits some surprising agreement properties as well. While some speakers prefer plural agreement with conjoined phrases, others accept singular agreement even if the conjoined phrase is in a derived subject position, as in (19) (Frederico Prado, p.c.).

(18) Criança lê revistinha.
child read.3SG comic book
'Children read comic books.' (Munn and Schmitt, 2005, 823, (1b))

(19) a. A menina e o menino caminharam pra escola
DET.F girl and DET.M boy WALK.PST.3.PL to school
'A girl and a boy walked to the school.'

b. %A menina e o menino caminhou pra escola.
DET.F girl and DET.M boy walk.PST.3.SG to school
'A girl and a boy walked to the school.'

Furthermore, speakers accept singular agreement with morphologically plural nouns as well, as in (20) (Frederico Prado, p.c.).

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(20) Eles caminhou pra escola.
they walk.PST.3SG to school
'They walk to the school.'

The last option to consider is a language in which person is not licensed at the DP level by the syntax-semantics interface at all. Instead, person licensing occurs only on a higher (verbal) phase head. In such a language there might not be any semantic plural at the DP level at all. Instead, we might, for instance, see optional cumulative plurals based on other features. Similarly, such a language might not make a morphological distinction between mass and count nouns with respect to morphological realizations of plurality. Furthermore, such a language might have no lexical anaphors, because association with a semantic index and thus binding would not be morphologically accessible at the DP level. Finally, plural agreement on predicates might always be semantically based. A possible candidate are Tupí languages. See, for instance, Zubizarreta and Pancheva (2017) on Paraguayan Guaraní, and Lima (2014) for Yudja.

Aside from cross-linguistic variation, the proposal made here raises a number of theoretical questions. First of all, it has consequences for our understanding of the operation of Agree. For instance, if certain semantically based values become available for Agree only after the relevant phase has been labelled by the syntax-semantics interface, we might obtain an illusion of upward Agree. Similarly, whenever D seems to act as a probe (as in some cases of possessive pronouns) we might see an instance of syntax-semantics labelling.

The proposal also raises questions for feature typology. First, is animacy/humanness a separate feature or only a side-effect of person associated with a semantic index? Second, do features like [±author] and [±participant] have any role in narrow syntax, or do they also arise only at the syntax-semantics interface via the association of person with a semantic index? Finally, what is the connection – if any – between classifying features and gender if at least some gender features are derived from the association of person with a semantic index by Maximize Presupposition?

I leave these questions for future research.

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