

Interactions between Morpho-Syntax and Semantics in English Agreement

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Jong-Bok Kim. 2003. Interactions between Morpho-Syntax and Semantics in English Agreement. *Language and Information 7.1*, 55–68. Most of the previous approaches to English agreement phenomena have relied upon only one component of the grammar (e.g., either syntax, or semantics, or pragmatics). This paper argues that interrelationships among different grammatical components play crucial roles in such phenomenon too (cf. Kathol 1999 and Hudson 1999). The paper proposes that, contrary to traditional wisdom, English determiner-noun agreement is morpho-syntactic whereas subject-verb and pronoun-antecedent agreement are reflections of index agreement (cf. Polard and Sag 1994). The present hybrid analysis of English agreement shows the importance of the interaction of different components of the grammar in accounting for English agreement phenomena. In particular, once we allow morphology to tightly interact with the system of syntax, semantics, or even pragmatics, we could provide a solution to some puzzling English agreement phenomena. This allows a more principled theory of English agreement. (Kyung Hee University)

Key words: English agreement, morpho-syntactic agreement, index agreement, interactions between morphology and syntax, constraint-based, semantic agreement

1. Introduction

Agreement, generally referring to a systematic covariance between two separate elements such as noun and verb, can be found in most languages. As noted by Corbett (1994), the agreement rule can be commonly represented in the form

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of 'X agrees with Y in Z'. For example, the statement in 1 could be an English agreement rule:

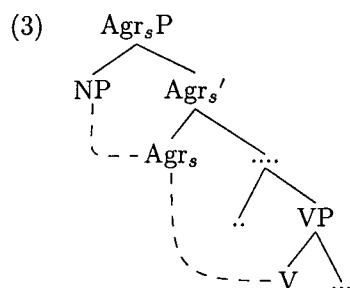
- (1) The predicate verb (agreement target) agrees with the subject (agreement controller) in the agreement features (number and person).

English obeys such a simple agreement rule in general, but issues arise when the agreement features expressed by the morphology of the agreement source (e.g. subject) do not match those in the agreement target (e.g. verb). Examples like 2 contradict the rule in 1.

- (2) a. This government have broken their promises.
- b. Five miles is a long distance to walk.

Here in 2a the subject is in the singular, yet the verb is plural. 2b is the opposite: we have a plural subject and a singular verb. In addition, we can observe that the number value on the determiner *this* and *five* in both cases mismatches the value on the verb. This paper proposes a constraint-based analysis for such mismatch cases where a noun requires one set of agreement features on the determiner whereas the NP headed by this noun triggers a different set of agreement features on verbs or coreferential pronouns (cf. Kathol 1999, Wechsler and Zlatić 2001).

There exist two main accounts of agreement set forth so far: 'derivational' and 'constraint-based' approaches (cf. Pollard and Sag 1994). The derivational view accepts a directional process that either copies, or moves bundles of agreement features from the agreement controller onto the target. More specifically, within the framework of Principles and Parameters or Minimalism, subject-verb agreement comes out as the result of two operations as represented in 3: the agreement relation between the subject in Spec of Agr_sP and the Agr_s head, and then the realization of the features of Agr_s on the verb. This realization results either from incorporation of V into Agr_s in syntax or directly in lexicon with the features for a morphological checking process (cf. Belletti 2001).



Meanwhile, in the constraint-based view, the two elements in an agreement relation specify partial information about a single linguistic object. Consider the tree representation in 4:

subject phrase inherits the morphosyntactic agreement features of the head noun (*hash*) *browns* in 5b and (*King*) *prawns* in 6 and require that these features match those of the verb, we would not predict the singular verb form in 5b and 6.

Examples with plural subject also with a singular verb show a conflict between the morphosyntactic agreement features of the subject NP and those that the singular verb normally demands for its subject.

- (7) a. Cherry cokes is the most popular drink here. (Reid 1991:194)
 b. The professional ethics arises from the requirement that analysis be unbiased (Biber et al. 1999)

In the examples 7, the subjects are morphologically plural whereas the verb is singular.

Another apparent exception to the syntactic rule is found with collective nouns. Examples in 8 display a mismatch of the morphosyntactic agreement features between the target and the source.

- (8) a. The government are planning new tax increases.
 b. The faculty are all agreed on this point.

When morphologically singular collective nouns such as *government* and *faculty* denote individual members of the group, they could be conceptualized as a plurality, thus agree with a plural verb. This agreement pattern could not be predicted if we simply rely on the morphosyntactic agreement features.

2.2 Against a Purely Semantic View

The examples we have seen so far may support a semantic based view of agreement. That is, one could argue that agreement is determined by the properties of a nominal referent rather than by the formal or morphological properties of the nominal itself (cf. Dowty and Jacobson 1988). In addition to the previous examples, cases supporting a semantic view seem to be prevalent. Consider the examples in 9:

- (9) a. John and only John is allowed in here (Corbett 1994: 58)
 b. This bomber and its cargo probably weighs over a hundred tons. (Biber et al. 1999: 180)

The conjoined NP in 9a and 9b has a single referent in terms of semantics and so the verb is in the singular form. In a semantic view, this is simply so because the subject refers not to plural individuals but to a single individual.

However, a semantic view also suffers from problems because of cases that require to make an appeal to syntactic factors too (as noted in Corbett 1994 and Barlow 1988: 227). Consider the examples in 10.

- (10) a. I am parked on the hill.
 b. You are the only one that can do this job.

The intended referent of the subject *I* in 10 is clearly a car, a third singular individual in terms of semantics, yet the verb isn't in the third person verb form.

Similarly, the verb form in 10b that goes with the pronoun *you* is always has to be plural in spite of the clear singularity of the subject in terms of semantics.

A similar problem arises from cases with pronoun-antecedent agreement. In the semantic view, the noun *family* would denote either an aggregate entity or a nonaggregate entity and thus can combine with either a singular or a plural verb as illustrated in 11.

- (11) a. His family are/*is all overweight.
b. His family is/*are moving to Seoul.

This view would then possibly predict cases like 12 where the speaker changed the individuation mode of the collective noun *Senate*.

- (12) **The Senate** just voted **itself** another raise. Most of **them** were already overpaid to begin with. (Pollard and Sag 1994: 72)

Nothing will block the referent of *the Senate* from being changed from singular to plural entities. As noted in P&S-94, however, such a change is subject to syntactic conditions. As illustrated in 13, we can observe that once the mode of individuation is decided, it is immutable within the intrasentential domain.

- (13) a. That dog is so ferocious, **it** even tried to bite **itself**.
b. That dog is so ferocious, **he** even tried to bite **himself**.
c. *That dog is so ferocious, **it** even tried to bite **himself**.
d. *That dog is so ferocious, **he** even tried to bite **itself**. (P&S-94)

The reflexive noun in 13 has to agree in gender with the matrix subject, the controller of the VP. The data here tell us that we cannot simply resort to the denotational possibilities when syntactic constraints (such as the Binding Principle) determine the antecedent for the agreeing element. This implies that English agreement needs to make an appeal to syntax also.

2.3 A Purely Index Agreement Approach

2.3.1 How this works. In solving the problems within the syntactic view and the semantic view, P&S-94 provides an appealing analysis of index agreement. Index agreement involves sharing of referential indices, closely related to the semantics of a nominal as represented in 14.

- (14)
$$\left[\langle \text{boy} \rangle \left[\text{CONTENT} \left[\text{INDEX} \left[\begin{array}{l} \text{PER 3rd} \\ \text{NUM sng} \\ \text{GEN masc} \end{array} \right] \right] \right] \right]$$

In the interpretation of a nominal, the index must be anchored to an individual in the context of utterance, to make sure of its proper usage in the real world. The index of *boy* in 14 thus must be anchored to an individual with the properties of singular masculine.

Meanwhile, a verb lexically specifies information about the index value of the subject it selects, as represented in 15.

$$(18) \left[\begin{array}{l} \langle \text{hash browns} \rangle \\ \text{CONTENT} \left[\begin{array}{l} \text{INDEX } \boxed{1} \left[\begin{array}{l} \text{PER 3rd} \\ \text{NUM sng} \end{array} \right] \\ \text{RESTR} \left\langle \begin{array}{l} \text{RELN} \quad \text{restaurant-customer} \\ \text{INSTANCE} \quad \boxed{1} \left[\begin{array}{l} \text{PER 3rd} \\ \text{NUM sng} \end{array} \right] \dots \end{array} \right\rangle \end{array} \right] \end{array} \right]$$

In the same manner, we could account for the singular plurals cases in 19.

(19) Eggs is my favorite breakfast.

The index value of the noun *eggs* here is anchored to an entity that bears the singular number value. Thus the singular verb *is* selecting a 3rd singular subject can combine with the singular plural subject.

Collective nouns can refer to either the group as a whole or individual members of the group, depending on the context, as in 20.

- (20) a. The family has suffered the anguish of repossession.
 b. The family are absolutely devastated. They are coping as well as possible. (Biber et al. 1999)

The index value that the noun *family* in 20a and 20b anchors to can be represented as the ones in 21:

$$(21) \quad \text{family in 20a:} \quad \left[\text{CONT} \left[\text{INDEX } \boxed{1} \left[\begin{array}{l} \text{PER 3rd} \\ \text{NUM sng} \end{array} \right] \right] \right] \quad \text{family in 20b} \quad \left[\text{CONT} \left[\text{INDEX } \boxed{1} \left[\begin{array}{l} \text{PER 3rd} \\ \text{NUM plur} \end{array} \right] \right] \right]$$

The analysis, combined with the independent principle of the grammar, also explains the matching condition on the agreement features between the verb and a reflexive pronoun as given in 22.

- (22) a. The faculty is voting itself/*themselves a raise.
 b. The faculty are voting *itself/themselves a raise.

What we observe in 22 is that the number value of the anaphor matches that of the verb. The matching condition between the index value of the subject and the anaphor is conditioned by the Binding Principle stating that a reflexive pronoun must be bound by a preceding argument of the same verb.¹ 23 is the argument structure of the verb *vote*.

¹ This could be reformulated as 'a reflexive pronoun in the argument-structure must be outranked by a coindexed element'. See Sag and Wasow 1999.

- (23) $\left[\begin{array}{l} \langle \text{vote} \rangle \\ \text{ARG-ST} \langle \text{NP}_i, \text{NP}[\text{ana}]_{i/*j} \rangle \end{array} \right]$

The coindexation indicates that the two NPs denote the same entity, thus they exhibit a form of agreement with the same values for PERSON, NUMBER, and GENDER (cf. Sag and Wasow 1999: 152).

2.3.2 Problems. Promising as it may seem, such an index agreement approach suffers from problems in examples like 24.

- (24) a. [Five pounds] is/*are a lot of money.
 b. [Two drops] deodorizes/*deodorize anything in your house.
 c. [Fifteen dollars] in a week is/*are not much.
 d. [Fifteen years] represents/*represent a long period of his life.
 e. [Two miles] is/*are as far as they can walk.

In all these measure noun examples, the plural subject combines with a singular verb, causing an apparent conflict between the agreement feature of the head noun and that of the verb. For the proper agreement with the determiner, the head noun has to be plural, but for subject-verb agreement the noun has to be singular. We cannot simply reclassify nouns such as *pounds*, *drops*, *dollars*, *years*, *miles*, etc. as singular, since this would then result in the mismatch with the determiner. There is no doubt that such nouns select for plural determiners since we cannot have phrases like **a pounds*, **this years* or **one dollars*.

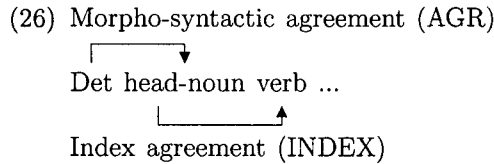
A similar conflict is also found in cases with social organization collective words like 25(data from Radford 1988).

- (25) a. [This/*these government] dislike(s) change.
 b. [This/*these England team] have put themselves in a good position to win the championship/has put itself in a good position to win the championship.

The head noun has to be singular so that it can combine with a singular determiner. But the conflicting fact is that the singular noun phrase can combine even with a plural verb as well as a singular verb. Since the only possible number value of the determiner is singular for the head noun, the head noun cannot be anchored to plural entities unless we allow the mode of individuation to be changeable even within the same sentence domain.

3. Proposal: A Hybrid Analysis

To solve such a mismatch, we claim that English determiner-noun agreement is simply a reflection of morphosyntactic agreement features between determiner and noun, whereas both subject-verb agreement and pronoun-antecedent agreement are index-based agreement as represented in 26.

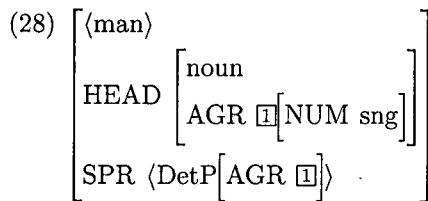


To be more precise, adopting the idea of Kathol's (1999) and Wechsler and Zlatić's (2001), we assume that a noun has two distinct features relevant to agreement: AGR and INDEX. The feature AGR is morpho-syntactic feature specifications encoded both on the source (noun) and on the target (verb) under the HEAD feature whereas the INDEX is semantic-based features on nominals.²

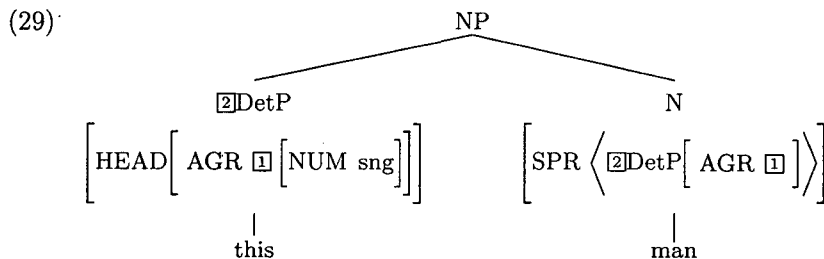
As for determiner-noun agreement in English, the only relevant information would thus be morphosyntactic NUMBER value as shown in 27.

- (27) a. every man/*every men
 b. *all man/all men
 c. this boy/*these boy

The matching conditions of the agreement features on the determiner and the head are enforced by the lexical selection of the head noun (cf. Sag and Wasow (1999)). For example, the noun *man* will have the lexical information given in 28.



As in 29, the noun *man* is morphologically singular and selects a determiner phrase whose morphological agreement information is compatible with its own. This lexical entry will then allow us to generate a structure like 29.



² The main motivation for introducing AGR as the head feature is clear manifestations of the morphological agreement markers in English (e.g., *-s* for nouns and *-es* for verbs). This could not simply be reduced to semantic factors. See Kathol 1999 and Sag and Wasow 1999.

- (32) a. Five books *is/are all I need.
 b. Five dollars is/*are all I need.

Armed with this view of English agreement, we are now ready to account for mismatch cases. First, consider cases with measure nouns repeated here in 33.

- (33) a. [Five pounds] is/*are a lot of money.
 b. [Two drops] deodorizes/*deodorize anything in your house.

The nouns *pounds* and *drops* here are morphologically plural and thus can select a plural determiner as argued so far. But when these nouns are anchored to the group as a whole, its index value has to be singular, as represented in 34.

- (34)
$$\left[\begin{array}{l} \langle \text{pounds} \rangle \\ \text{HEAD} \left[\begin{array}{l} \text{noun} \\ \text{AGR} \left[\begin{array}{l} \boxed{1} \\ \text{NUM plur} \end{array} \right] \end{array} \right] \\ \text{SPR} \left\langle \text{DetP} \left[\text{AGR} \left[\begin{array}{l} \boxed{1} \end{array} \right] \right] \right\rangle \\ \text{CONT} | \text{INDEX} \left[\begin{array}{l} \text{NUM sing} \end{array} \right] \end{array} \right]$$

This explains why the verb needs to be singular.

This analysis also could account for the mismatch in collective nouns one of whose examples is repeated in 35.

- (35) [This/*these government] dislike(s) change.

More precisely, we could represent the relevant information of the expressions participating in these agreement relationships as in 36.

- (36) a.
$$\left[\begin{array}{l} \langle \text{this} \rangle \\ \text{HEAD} \left[\begin{array}{l} \text{det} \\ \text{AGR} \left[\begin{array}{l} \text{NUM} \\ \text{sing} \end{array} \right] \end{array} \right] \end{array} \right]$$
- b.
$$\left[\begin{array}{l} \langle \text{government} \rangle \\ \text{HEAD} \left[\begin{array}{l} \text{noun} \\ \text{AGR} \left[\begin{array}{l} \text{NUM} \\ \text{sing} \end{array} \right] \end{array} \right] \\ \text{CONT} | \text{INDEX} \left[\begin{array}{l} \boxed{1} \\ \text{NUM plur} \end{array} \right] \end{array} \right]$$
- c.
$$\left[\begin{array}{l} \langle \text{dislike} \rangle \\ \text{HEAD} \left[\begin{array}{l} \text{verb} \\ \text{AGR} \left[\begin{array}{l} \text{NUM} \\ \text{plur} \end{array} \right] \end{array} \right] \\ \text{VAL} | \text{SUBJ} \left\langle \text{NP} \left[\text{INDEX} \left[\begin{array}{l} \boxed{1} \\ \text{NUM plur} \end{array} \right] \right] \right\rangle \end{array} \right]$$

As represented in 36a and 36b, *this* and *government* agree each other in terms of the morphosyntactic agreement number value whereas the index value of *government* is token-identical with that of the subject that the verb *dislike* in 36c selects.

Such an analysis will also capture the variation of the verb depending on the context.

- (37) a. Five boys count the money.
 b. Five boys counts as one team. (Reid 1991: 331)

The head noun has a morphologically plural AGR value but could either be anchored to multiple boys conceived as discrete entities or a group of five boys as a whole.

One immediate consequence of this analysis is that it solves the contrast between *faculty*-type collective nouns (e.g. *staff*) and *family*-type collective nouns (e.g. *committee*, *government*) in a straightforward manner. The clear difference between these types is signalled by the contrast between 38b and 39b (data from P&S-94):

- (38) a. Every faculty meets/*meet on a monthly basis.
 b. All faculty *is/are required to submit midterm grades.
 c. All faculties *meets/meet on a monthly basis.
- (39) a. Every family gets/*get together for the holidays.
 b. All family *is/*are asked to bring a dessert or a salad.
 c. All families are asked to bring a dessert or a salad.

As pointed out in P&S-94, one could argue that *faculty*-type nouns can be anchored to either to a singular index or plural indices, whereas *family*-type nouns denote entities that are individuated as nonaggregate. This would account for the contrast. But then an issue arises from examples like 40, which the P&S-94 analysis left unresolved.

- (40) a. John's family are destroying themselves.
 b. His family are/*is (all) overweight.

P&S-94 hints that *John's family* might be transferred from a nonaggregate to the aggregate entity. But then a question arises why we couldn't apply the identical reference transfer for *all family*, allowing examples like 39b.

But notice that our hybrid analysis provides a straightforward solution. In terms of the morphosyntactic AGR feature, [*every faculty*] and [*all faculty*] are both acceptable since [*faculty*] can have either plural or singular morphosyntactic number AGR feature.³ But the situation is different in *family*: this noun can bear only the singular morphosyntactic AGR feature. The expression *[*all family*] is thus simply unacceptable because of the mismatch in the morphosyntactic number value of the AGR between *all* and *family*. Examples like 40a are acceptable since

³ As an anonymous reviewer pointed out, this would predict expressions like *a faculty* or these faculties.

the subject [*John's family*] whose INDEX's number value is plural agrees with the singular verb whose INDEX's number value is also plural.

This analysis also provides a proper treatment of pronoun-antecedent agreement which is also index-based, rather than morpho-syntax-based.

- (41) a. This England team has put itself/*themselves in a good position to win the championship.
 b. This England team have put themselves/*itself in a good position to win the championship.

In accordance with the Binding Principle, the reflexive has to be bound by a preceding argument of the same verb in the argument structure. This in turn means that the binder and the reflexive are coindexed.

- (42) $\left[\begin{array}{l} \langle \text{put} \rangle \\ \text{ARG-ST} \langle \text{NP}_i, \text{NP}[\textit{ana}]_{i/*j}, \text{PP} \rangle \end{array} \right]$

In 41a the head noun *team* has to have a singular index value for subject agreement. This requires any reflexive noun in the same argument structure to have the singular index value too. Meanwhile in 41b, the verb is plural, implying that the subject is anchored to individuals of the group. This mode of individuation cannot be changed, thus requiring a 3rd person plural reflexive pronoun.

4. Conclusion

In sum, we have claimed that English employs morphosyntactic agreement for determiner-head noun agreement and index agreement for subject-verb and antecedent pronoun agreement. This approach, based upon a constraint-based grammar, allows agreement targets such as head noun and verb to contain the information that covaries with the information specified on the selected category. This way of agreement makes explicit what kinds of features are involved for each agreement pattern.

This paper shows that the interaction of different components of the grammar plays a crucial role in English agreement phenomena. In particular, once we allow morphology tightly to interact with the system of syntax and semantic knowledge, we can provide a solution to some puzzling English agreement phenomena. This results in a more principled theory of English agreement.

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