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The Agreement Hierarchy and (generalized) semantic agreement

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Agreement systems often allow alternatives: *This family has / have lost everything***.** Therefore typology requires a means for generalizing over them. Instances like PLURAL *have* are frequently termed "semantic agreement" (vs. "syntactic agreement" for SINGULAR *has*), but this notion has proved difficult. The challenge is to encompass the full typological range of alternative agreements. These include the core instances: (i) hybrid nouns like *family*; and (ii) constructional mismatches, such as conjoined nominal phrases, but also less obvious phenomena: (iii) split hybrids where neither alternative is straightforwardly semantic, both appear related to form, and (iv) examples like Scandinavian "pancake sentences", which stretch semantic agreement towards pragmatics. These different types are comparable in that (i) the alternatives are realized by the normal agreement forms; and (ii) they are subject to the Agreement Hierarchy. Hence they demand a common treatment. To achieve this, I first unpack the Agreement Hierarchy constraint into the agreement target positions and the directionality implied by "semantic agreement". I show how the latter arises from mismatches between the agreement information available from different sources. Typically, in the core instances, the information from one source is more evidently semantic than from the second. But in other instances, this is less clear. I argue that it is more parsimonious to treat these less obvious phenomena as falling under the constraint of the Agreement Hierarchy. They are seen as part of the pattern of a Hierarchy of Agreement Sources, which gives different degrees of "generalized semantic agreement". This reworking offers a more robust underpinning to the Agreement Hierarchy, and fits into a current trend: a typology that works is no longer sufficient, rather we examine and justify the defining criteria, and relate them to the underlying attributes of the domain.

1 Introduction: why we need “semantic agreement”

Agreement is fascinating. It may be straightforward, with just one possibility for how an agreement target agrees with its controller, but more interestingly it may allow more than one option. An essential component for the typology of agreement systems is therefore a way to generalize over the distribution of such alternatives. Here “semantic agreement” is often called on. And while the notion is “not wholly satisfactory” (Corbett 1979: 201), we lack a secure solution. That is what I offer here.

What was the motivation for proposing semantic agreement? Consider the newspaper headline in (1a) and the alternative in (1b):

(1) a. This family **have** lost everything[1]
b. This family **has** lost everything

We find agreement alternatives here, though the controller remains the same. The PLURAL target *have* in (1a) shows what many would label semantic agreement, while SINGULAR *has* is also found (1b). The choice between SINGULAR and PLURAL agreement is restricted, however, since within the nominal phrase we have only *this family*: the PLURAL attributive **these* is excluded. This distribution, which contrasts a predicate agreement target with agreement within the nominal phrase, fits within more general patterns that we wish to capture. And so, for a full typology of agreement alternatives we need to look beyond just the **NUMBER** values SINGULAR and PLURAL, for three reasons:

(i) we find similar examples involving features other than **NUMBER**, most often **GENDER**.

(ii) for a given feature, the question of which value will count as semantic agreement can have different answers in different circumstances. In (1a) the PLURAL counts as semantic agreement. In contrast, in the Czech example (2), we have a PLURAL finite verb, but SINGULAR participle and predicate adjective:

(2) *Czech* (cze) polite address (Comrie 1975: 408, Puškar-Gallien 2019: 3)
vy jste by-l-a dobr-á[2]
2PL AUX.2PL be-PST-SG.F kind-SG.F
‘you (single female addressee) were kind’

[1] https://www.huntspost.co.uk/news/fundraising-pages-for-st-neots-house-fire-6757220. When syntactic and semantic agreement co-occur, as in (1a), this is increasingly labelled “mixed agreement”, as in Wechsler (2011).

[2] I follow the Leipzig Glossing Rules https://www.eva.mpg.de/lingua/resources/glossing-rules.php; [ ] indicates information that can be inferred from the use of the bare stem; < > marks infixation; ( ) is for inherent, non-overt feature values; this latter is not used for hybrids since they do not have a single value; bold is used as a flag to draw attention to relevant characteristics of examples. Abbreviations are the Leipzig ones with additions (see list at end of paper). Features like **NUMBER** and values like PLURAL are differentiated in this way whenever clarity is improved.

In (2) the SINGULAR counts as semantic agreement, contrary to (1a). This shows that determining semantic agreement directly from feature values will not work; rather it varies by construction.

(iii) there are instances where we need to allow for more than two possible agreement alternatives. This means that binary terms will not be sufficient (see §2 below), rather we need a scale (typological dimension).

Thus the notion semantic agreement is useful for the generalizations it permits. There are various terms in use, discussed in the Appendix. For some linguists the terminology is of secondary importance; for others, however, the term matters, since "semantic agreement" brings with it theoretical baggage. Thus Danon (2014: 95) writes: "So-called "semantic agreement" has been a problem to mainstream generative syntax for years." He wishes to defend the position that " … agreement itself is blind to semantics" (2014: 114). For some linguists, then, "semantic agreement" is no innocent label, since it implies a challenge to certain assumptions about the interaction of components of the grammar, a challenge that remains actual.[3] Johnson & Joseph (2014) are uneasy about "semantic agreement" because it covers disparate phenomena, not all of which are truly semantic. We shall see that it is helpful to spell out the range of phenomena involved, including those which need access to pragmatic information (to mark politeness, for example, as in §4.4.2).

Despite such concerns, there are strong arguments for treating the different phenomena together, since they share two key similarities. First, the agreements covered are the same, in that they are realized through the same forms (there is no special morphology for the different instances). And second, the different agreement patterns are constrained by the Agreement Hierarchy (§2). Hence what is labelled "semantic agreement" represents a powerful generalization,

[3] Attempts to implement alternative agreement possibilities in formal frameworks have typically been restricted to only a part of the data. There are two basic approaches. Some, particularly within Minimalism, would deny the existence of alternative agreements, preferring to add additional syntactic material (elaborating the syntactic tree) to account for one of the options. There are then no alternative agreements but rather alternative structures. Our typology of mismatches is then implemented as greater or lesser structural modifications. The other approach, found particularly within HPSG and LFG, gives a greater role to the feature system, and this is more closely attuned to the typological facts. A common route is to extend the types of feature available, often distinguishing index features from concord features; see, for example, Kathol (1999), Wechsler & Zlatić (2003), Danon (2014: 110-113), Landau (2016) and Wechsler (2009; 2021). Elaborating the feature system does not offer easy solutions: there is no straightforward prediction as to the distribution of these feature types (since we find index features even within the nominal phrase); moreover, as noted later (§5), we find systems with more than two agreement alternatives. Helpful discussion can be found in Wechsler (2011), who argues that the concord-index distinction is orthogonal to the syntactic-semantic agreement issue. Bond, Corbett, Chumakina & Brown (2016) offer a new perspective, by describing semantic agreement in the Dagestanian language Archi (aqc), comparing how different syntactic frameworks (HPSG, LFG and Minimalism) handle the data. Smith (2021) also discusses HPSG analyses, while concentrating on a Minimalist account of different types of hybrids and what they tell us about feature structures. Our concern here is not specific implementations proposed for parts of the problem, but rather the full typology of phenomena.

and the disparities between the phenomena involved only add to its importance. It is natural that, as further constructions are found which follow the constraint, the term "semantic agreement" becomes stretched. A solution is proposed in §3. Next I review the range of phenomena that a typology of agreement alternatives must include (§4), showing how the proposed solution covers each. In §5 I analyse examples with more than two agreement alternatives. §6 considers the different levels of generalization involved. And in §7 we review progress. This paper helps to provide a firm underpinning for the Agreement Hierarchy, in the spirit of Round & Corbett (2020). Elsewhere, Corbett (2022b) gives a principled account of agreement controllers, while here the component "semantic agreement" is made more secure.

2 Interaction with the Agreement Hierarchy

The distribution of what has been termed semantic agreement is tightly constrained by the Agreement Hierarchy, which consists of the target positions in **Figure 1**.

attributive > predicate > relative pronoun > personal pronoun

Figure 1: The Agreement Hierarchy (Corbett 1979).

The constraint of the Agreement Hierarchy was first stated in binary terms, regulating the distribution of syntactic vs semantic agreement (Corbett 1979: 204). The modern version of the constraint uses gradient terms:

(3) *Constraint of the Agreement Hierarchy (to be replaced in (9))*
For any controller that permits alternative agreements, as we move rightwards along the Agreement Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically (that is, with no intervening decrease).
(Corbett 2006: 207)

In this version, "greater" does not imply "great". We have a relative measure which applies to items low on the scale as well as to those high on it (just as the temperature scale ranks cool items above even cooler items). Some cases where linguists are uncomfortable with the use of "semantic agreement" are of this type, that is, they are not "very semantic", though they are arguably "more semantic" than the alternative. This constraint has served well,[4] but it is now time to go further, by generalizing what is measured.

The original research on the Agreement Hierarchy captured the core of alternative agreements. It did so by bundling issues together. We now wish to account for further sets of data, situated

[4] The different types of prediction from the constraint are separated out in Smith (2021: 83–96). And for the role of processing, see Sturt (2022).

further from the core. To do this, we need to step back and unpack the issues; we can then make progress incrementally. The argumentation will be partly circular, and so we need to ensure that our circles are virtuous. We start from core instances, lexical hybrids like *family* in (1) above. These fit the constraint of the hierarchy, in having only SINGULAR agreement in attributive position, and SINGULAR and PLURAL in the remaining positions, but with PLURAL increasing in frequency as we move left to right along the hierarchy. These could be covered by a basic constraint, simpler than the original one:

(4) *Simple constraint of the Agreement Hierarchy*
if an agreement controller induces different values (A, B) of a given feature, on different targets of the Agreement Hierarchy
then there must be a monotonic shift from one to the other as we move along the hierarchy.

This is already a substantive claim. It covers all relevant controllers. It applies at corpus level, which means that it can be readily operationalized (take a corpus, count all instances of agreement, isolate the controllers whose agreements are not consistent ...). The constraint in (4) allows for the distributions in (5):

(5) Distributions of agreement alternatives consistent with the Agreement Hierarchy

	attributive	predicate	relative pronoun	personal pronoun
Controller R	A	A	B	B
Controller S	A	A/B	B	B
Controller T	A	A (70%) B (30%)	A (30%) B (70%)	B

The feature values in (5) might be, for instance, A = SINGULAR, B = PLURAL. The percentage distributions are just a subset of the possibilities allowed. The effect of the monotonic requirement is to cover both categorical instances (as with Controller R), and gradient instances (as with Controllers S and T); compare Corbett (2006: 157–159). More significantly, the constraint rules out many theoretically possible distributions, including those in (6):

(6) Distributions of alternatives not consistent with the Agreement Hierarchy

	attributive	predicate	relative pronoun	personal pronoun
*Controller V	A	B	A	B
*Controller W	A/B	A	A/B	A
*Controller X	A	A (30%) B (70%)	A (70%) B (30%)	B

The claim in (4) above is a worthwhile constraint. It rules out a significant portion of the theoretical space (such as the examples in (6)). Contrary to what we might have expected,

attributive modifier and relative pronoun do not pattern together (unless the predicate is part of the pattern). However, it allows the following:

(7) Further consistent distributions

	attributive	predicate	relative pronoun	personal pronoun
Controller Y	A	A	B	B
Controller Z	B	B	A	A

For instance, imagine a variety of English, in which *committee* took SINGULAR agreement of attributive and predicate targets, and PLURAL of the pronouns (an example of Controller Y in (7)). Could there be another controller, which took the "opposite" agreements, those of Controller Z in (7) (as is allowed by (4))?

An obvious move would be to refer to the feature, in this case **NUMBER**, and claim that the values of a single feature must be distributed with the same directionality. That is, we may find Controller Y or Controller Z, but not both. This approach fails; the PLURAL can be the appropriate value at the right of the Agreement Hierarchy (as with *family*) or at the left (as seen later in (12)). While the values are different in (7), the patterns of Controllers Y and Z are consistent in a sense. Yet we naturally wish to constrain further the distribution of agreement A and agreement B, beyond the constraint in (4), and it is here that interesting issues arise. We need a way to generalize over features and values, in how they are constrained by the Agreement Hierarchy. This is what the notion "semantic agreement" did, and it is this generalization that we need to unpick.

More generally, suppose that we find a new construction, which shows alternative agreements. In principle it could be quite different from the familiar ones: it need not follow the constraints on targets, which is the Agreement Hierarchy, nor show an obvious instance of semantic agreement. Such a construction would greatly complicate our account of agreement. If, however, it follows the Agreement Hierarchy, in that the distribution of agreement A and agreement B is one of those allowed by the hierarchy (as in (7) for instance), then using the existing constraint of the Agreement Hierarchy represents a desirable simplification. But what if the content of A vs B is not straightforwardly one that represents semantic information? We would wish to bring these data within the scope of the hierarchy; this is a more parsimonious account than one which treats the new construction as quite other.

In the best case we wish, *additionally*, to specify which of A and B will occur higher on the hierarchy for a given construction. If our current definition of "semantic agreement" does not provide this, then the evidence of the distribution over the target positions would lead us to refine our definition. This is a virtuous circle. We have agreement examples which do not fit

within the core data supporting the hierarchy; rather than treating them as something quite different, we begin with the structural fit (the pattern of agreements matches the hierarchy) and we use this fit to refine our account of semantic agreement.

All this brings two terminological options. We could decide that "semantic agreement" is not fully satisfactory, since it does not cover all the instances already associated with the Agreement Hierarchy, and is further stretched by more recent data, as we shall see (§3.2). We might then propose a new term. The alternative is to accept that "semantic agreement" is well-established and is unlikely to be set aside. Following this view, I shall refer to "generalized semantic agreement", which comprises the old semantic agreement at its core, plus an extended range to be defined below. This extended range includes both instances that are "less than semantic" and others that are "more than semantic". And then, we need to examine how far we can determine which alternative agreement counts as "A" and which as "B". We tackle this issue in §3.

3 Generalized semantic agreement: predicting directionality

I claim that the locus of the information which determines agreement varies from (i) being localized to one cell of the paradigm of the controller (at one extreme) to (ii) being extraneous to the controller (at the other extreme). The five sources are given in **Figure 2** (with more canonical, indicated >, to the left); they are numbered for cross-reference to **Figure 3** below.

specification of cell (1) >	morphosyntactic specification (2) >	lexical semantics (3) >	complex nominal construction (4) >	extraneous source (5)

Figure 2: Hierarchy of Agreement Sources.

In the canonical case, the information from all possible sources is consistent. Where there is a mismatch in the information provided, the relation between the sources which are mismatched allows us to predict the directionality of the values A and B. It does so in terms of generalized semantic agreement, and hence of what their relative places will be on the Agreement Hierarchy.

(8) Generalized semantic agreement
Where there is a mismatch between sources of agreement information, the source to the right on the Hierarchy of Agreement Sources will be the one with the greater degree of generalized semantic agreement.

We see how this works first with familiar examples in §3.1; for these, "semantic agreement" was often used, even if not fully adequate. We then extend our analysis to novel examples in §3.2, and these are also included within "generalized semantic agreement". Then we see how this Hierarchy of Agreement Sources allows us to capture intuitions about semantic agreement (§3.3).

3.1 The Agreement Hierarchy: established examples

Let us start with lexical hybrids such as *family*: there is a mismatch between their morphosyntactic specification SINGULAR (justified below) and their lexical semantics (they denote a multiplicity). This mismatch gives rise to alternative agreements, with PLURAL agreement having the greater semantic justification; the patterns of agreement match the constraint of the Agreement Hierarchy With constructional mismatches, such as *girl and boy*, the mismatch is between the parts and the whole. We have a complex nominal construction, here involving conjoined elements; the parts (conjuncts) are individually SINGULAR, while the whole is PLURAL. In *this girl and boy have agreed*, PLURAL agreement is taken to have greater semantic justification, and again the agreement patterns are in accord with the Agreement Hierarchy. These are the core instances of semantic agreement, and they are shaded in **Figure 3**.

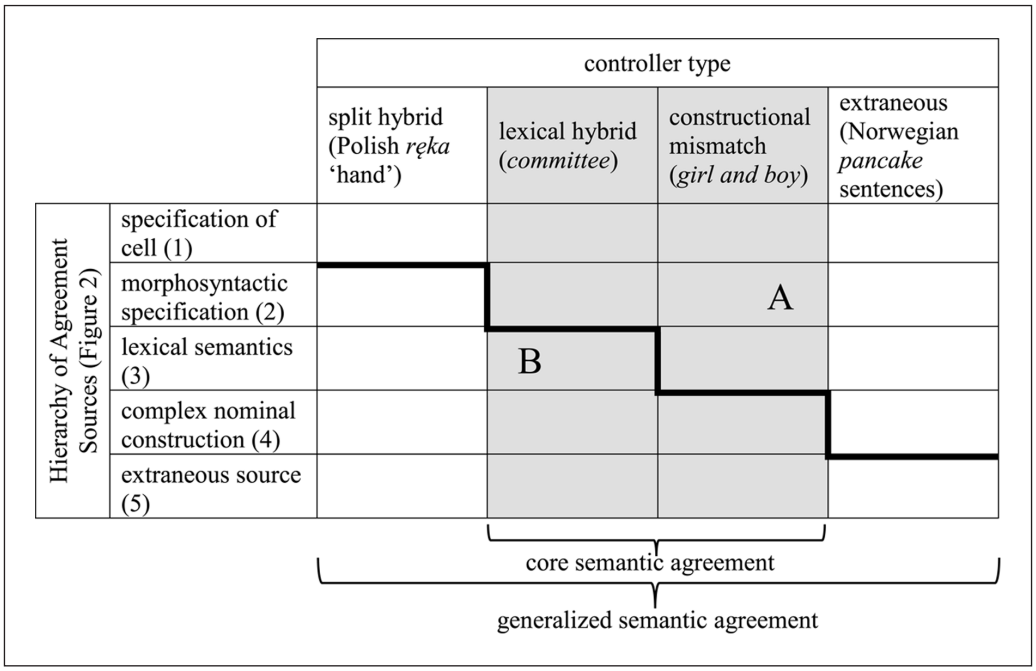

Figure 3: Core and generalized semantic agreement.

Under "controller type" in **Figure 3**, I give a description, together with a single example. Within the figure, "A" represents syntactic agreement (all instances above the heavy line), and "B" generalized semantic agreement (all instances below).[5] On the left of **Figure 3**, we have the Hierarchy of Agreement Sources, the five possible locations of agreement information (numbered as in **Figure 2**). In the canonical world, all the available information would be the same, and the

[5] For simplicity, Figure 3 gives binary choices. We need to allow for more than two, and hence "semantic agreement" is a matter of degree, which is why the constraint (8) refers to "the greater degree of generalized semantic agreement". Examples with more than two options are discussed in §5.

controllers would take consistent agreement. When different information is provided, there are logically four possible types of mismatch: between the sources above the heavy black line and those below, with the source below the line giving rise to generalized semantic agreement (B), as stipulated in (8).[6]

This analysis requires us to establish the morphosyntactic specification of an item. This is not always straightforward, but there is a fine tradition of work here, particularly by members of the Set-theoretical School. They demonstrated how we establish a language's feature values by examining the evidence from inflection, while controlling for syntactic context. A summary, and references to the extensive literature, can be found in Corbett (2012: 73–88). For instance, we can readily establish that English has a **NUMBER** feature with the values SINGULAR and PLURAL. There are many nouns with an inflectional distinction (*dog* vs *dogs*) matched by an agreement distinction (*dog is* vs *dogs are*). Thus *dog* is has the morphosyntactic specification SINGULAR, and *dogs* is PLURAL. These specifications are consistent: they apply whatever the agreement target. Once we have established a language's features and their values, hybrids stand out (van Helden 1993: 984–993), since it is not obvious how to assign a feature value to them. However, we can use the canonical items (those which take consistent agreement patterns) as a measure for hybrids. For instance, *family* has the same two agreement possibilities as *dog*. In addition, there is *family are*. The agreements with *family* are not consistent, in that the attributive modifier must be SINGULAR, but the predicate can be PLURAL. The latter possibility arises not from the morphosyntactic specification, which is SINGULAR, but from the lexical semantics, which involves a multiplicity According to (8), when we have alternative agreement resulting from a mismatch between the morphosyntactic specification and the lexical semantics, it is the lexical semantics which induces semantic agreement (as represented in **Figure 3**).[7]

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[6] The significant mismatches are those between cells immediately above and below the heavy line, since this is where we see the effect of the Hierarchy of Agreement Sources most easily (as, for example, the mismatch between morphosyntactic specification (SINGULAR) and lexical semantics (multiplicity) for *committee*). Elsewhere in Figure 3, a particular example could fit the description of more than one cell (for instance, a lexical hybrid could figure in a complex nominal construction); this is not a problem, since the prediction in terms of generalized semantic agreement remains the same. For three-way comparison see §5.

[7] Some try to avoid this conclusion by adding a feature value; for example, *family* might be given a value +COLLECTIVE or +CORPORATE. There are good reasons to reject this suggestion (Corbett 2012: 99–105). Note that there are no special agreement forms associated with this proposed number value (unlike SINGULAR and PLURAL). Rather +CORPORATE means: "select from SINGULAR and PLURAL". Yet it does not specify the value: it is thus an odd feature value (rather a label for a problem). A key point is that the distribution of agreements varies considerably for different nouns: thus *family* frequently takes PLURAL agreement, while *government* does so much less often; nouns like *team* and *committee* fall between (Corbett 2022b: 195–196 gives a compilation of statistical information). Thus +CORPORATE does not specify which agreement will appear. Moreover, this value would not generalize to **GENDER** hybrids; these would require additional feature values, and there is no prediction that these new gender values would behave similarly to +CORPORATE. The latter is a generalization at the wrong level, which fails to deliver the necessary agreements.

With hybrids like *family*, it is relatively easy to argue for PLURAL agreement being semantic agreement. Now consider the less straightforward example of a gender hybrid, German *Mädchen* 'girl', which takes NEUTER and FEMININE agreements. Which is semantic? "Obviously" the FEMININE, since this noun denotes a female human. However, the German NEUTER is associated with the semantics young/small (derived diminutives are NEUTER), so this argument is not clear-cut. Recall, though, that with *family* we had the SINGULAR form contrasting with the lexical semantics of the noun. With *Mädchen* 'girl' the set of its inflectional forms (its paradigm) is consistent with it being of NEUTER (not FEMININE) gender. Hence it is reasonable to argue that it is morphosyntactically specified as NEUTER (and hence NEUTER agreement is syntactic), and that its lexical semantics includes 'female human' (hence FEMININE agreement is semantic). This mismatch (morphosyntactic specification vs lexical semantics, **Figure 3**) implies a directionality for this item: FEMININE should represent semantic agreement, which conforms with its behaviour in respect of the Agreement Hierarchy.[8] For more on *Mädchen* 'girl', see Braun & Haig (2010), Birkenes, Chroni & Fleischer (2014), Binanzer, Schimke & Schunack (2022) and Lind & Nübling (2022).[9]

Complex nominal constructions have more structure than a single nominal phrase. A familiar example is conjoined nominal phrases. Given *this girl and boy have …* it is evident that the source of the PLURAL agreement *have* is not to be found in the morphosyntactic specification of the nouns, nor in their lexical semantics, but in the construction: it is the combination here which denotes more than one individual, and hence the PLURAL is the semantically agreeing form. Thus the familiar examples, lexical hybrids and constructional mismatches, can be analysed in the way proposed, and the expected agreements do indeed count as semantic agreement.

3.2 The Agreement Hierarchy: novel examples

We now move to the fuller picture, to include "generalized semantic agreement", which involves a modification to the constraint (italicized in (9)):

(9) *Revised constraint of the Agreement Hierarchy*
For any controller that permits alternative agreements, as we move rightwards along the Agreement Hierarchy, the likelihood of agreement with a *greater degree of generalized semantic justification* will increase monotonically (that is, with no intervening decrease).

[8] It might be objected that "of course" it is NEUTER, as stated in dictionaries. But dictionaries typically take the value from the definite article, and *Mädchen* 'girl' is not simply NEUTER but is a hybrid. The relation of NEUTER to FEMININE is precisely what we need to demonstrate for these core instances, before moving to the novel examples.

[9] Köpcke, Panther & Zubin (2010: 174–178) contrast nouns like *Mädchen* 'girl', where the use of a FEMININE pronoun does not involve a shift in reference (their "conceptual agreement"), and what they call "metonymic agreement", as in using the FEMININE *Gitarre* 'guitar', with a MASCULINE pronoun, to indicate a male guitarist, which does involve a shift in reference. This latter can be seen as part of "extraneous agreement" (§4.4 below).

Semantic agreement is generalized by being extended in two directions, and we consider here an instance of each. In §3.2.1 we look at alternative agreements which could be considered "less than" semantic, while in §3.2.2 the agreement is "more than" semantic. In each case the agreements follow the pattern of the Agreement Hierarchy (**Figure 1**), and the mismatches which induce the alternative agreements logically extend the mismatches found with the instances of core semantic agreement.

3.2.1 Specification of cell vs morphosyntactic specification: Polish split hybrid *ręka* 'hand'

The split hybrids that interest us here are rare and under-researched: these are hybrids in a single cell of the paradigm. We concentrate on Polish (pol) *ręka* 'hand, arm'.[10] In the LOCATIVE SINGULAR, this noun is overabundant (Thornton 2019): it has both the expected form *ręce* (the consonant alternation is regular) and a second form *ręku*; this latter form originates in the former DUAL, but it now functions as a LOCATIVE SINGULAR. Initial data are given in Corbett (2022a: 63–65, 68–69, 81–82). *Ręka* 'hand, arm' belongs to an inflection class which would imply FEMININE gender, and FEMININE is what we normally find in agreement, including with the regular LOCATIVE form *ręce*. Yet the less expected LOCATIVE SINGULAR form *ręku* would fit into two different inflection classes, one predicting MASCULINE and the other predicting NEUTER; in the LOCATIVE SINGULAR, however, MASCULINE and NEUTER share the same agreement form (a form distinct from the FEMININE). When the LOCATIVE *ręku* appears, the agreement is like this (seven instances of exactly this phrase were found in the National Corpus of Polish, http://nkjp.pl/poliqarp/, searched 28 May 2020, and no examples were found with FEMININE agreement):

(10) *Polish*
w lew-ym ręk-u
in left-SG.LOC.**M/N** hand-SG.LOC
'in the left hand'

In the full paradigm, just the LOCATIVE SINGULAR cell has cell-mates which could induce different agreements, and this is what we find: FEMININE agreement with the regular LOCATIVE form *ręce* and masculine / neuter with the irregular *ręku* are determined by gender assignment. Next we need to look at other agreement targets. The LOCATIVE case value is not available for subjects, and so we cannot examine predicate agreement. Let us look at the personal pronoun:

(11) W lew-ym ręk-u trzym-am ten długopis.
in left-SG.LOC.**M/N** hand-SG.LOC hold.PRS-1SG this[SG.ACC.M] pen(M)[SG.ACC]
'I'm holding this pen in (my) left hand.'

[10] I thank Axel Holvoet for pointing out *ręka* 'hand, arm', and Dávid Győrfi for his help with work with consultants. Data are scarce, and more work is needed with both corpora and consultants.

Złama-ł-a-m ją / *go / *je dwa miesiąc-e temu.
(I) break-PST-SG.F-1SG 3SG.**F** / *3SG.M / *3SG.N two month-PL.ACC ago.
'I (woman) broke it two months ago.'

(Ale teraz jest już zdrow-a / *zdrow-y / *zdrow-e.)
(but now (it) be.PRS.3SG already healthy-SG.**F** / *healthy-SG.M / *healthy-SG.N)
('But already it's fine.')

The personal pronoun is FEMININE as shown in (11). The relative pronoun proves difficult, since continuations of a phrase like *w lewym ręku* 'in the left hand' typically concern either the person involved, or the object in the hand. This makes relevant corpus examples scarce, and means that it is important to provide an appropriate context for consultants. The original speakers consulted required FEMININE agreement of the relative pronoun; ongoing work suggests masculine agreement is also possible for some. Both alternatives fit with the constraint of the Agreement Hierarchy. Thus with the exceptional LOCATIVE SINGULAR form, attributive modifiers are MASCULINE / NEUTER, predicate agreement is excluded (for other reasons), the relative pronoun is FEMININE or MASCULINE (= NEUTER in most cases), and the personal pronoun is FEMININE. This item is a hybrid: it takes agreements of two different genders, following a pattern which is consistent with the Agreement Hierarchy. The mismatch is between the morphosyntactic specification of one cell of the paradigm versus that of the lexeme as a whole (**Figure 3**).

Is it reasonable to say that FEMININE agreement has greater semantic justification? It was argued that it does (Corbett 2022a: 82). The argument was that the use of FEMININE agreement with *ręku* 'hand.SG.LOC', that is, the use of the gender value of the noun as a whole (in targets outside the nominal phrase), allows *ręka* 'hand' to be tracked as the antecedent. But this is stretching the traditional notion of "semantic agreement". Which brings us again to the two ways forward. We can say that the Polish agreement pattern is quite different, and needs a separate analysis, complicating the typology of alternative agreements. Or we say:

(i) The distribution of agreements fits the simple constraint of the Agreement Hierarchy pattern (as in (4));
(ii) the mismatch fits logically into the pattern shown in **Figure 3**;
(iii) there are further comparable examples, referenced in §4.1.

Therefore, we adopt generalized semantic agreement (as in (8)), as the more parsimonious account.

3.2.2 Extraneous agreement: Norwegian "pancake sentences"

Having looked at alternative agreements which are "less than" semantic, we now turn to those which are "more than" semantic. A good example is "pancake sentences", which are prevalent in Scandinavian languages, as in this Norwegian example:

Norwegian (Bokmål nob, Enger 2004: 20)

(12) **Nystekt-e** pannekake-r er **god-t**.
new.fried-PL pancake-PL COP good-**SG.N**
'Newly-fried pancakes is good.' ('Eating newly-fried pancakes is good.')

We find normal agreement within the nominal phrase, but NEUTER SINGULAR in the predicate. This NEUTER SINGULAR agreement can reasonably be treated as "default agreement", that is, the agreement found where there is no straightforward agreement controller. In other words, the choice is between normal agreement and default agreement. There is an Agreement Hierarchy effect; this next example includes other target possibilities, where again we find default agreement:

(13) *Norwegian* (Bokmål, Hans-Olav Enger, personal communication)
Narkotika, **som** er **grusom-t** for både misbruker-e og
narcotic(M)[SG], COMP COP awful-**SG.N** for both addict-PL and
pårørende, **de-t** skulle aldri vær-t oppfunn-et.
relatives.spouses, it-**SG.N** should never be-PST.PTCP invent-PST.PTCP
'Drugs, which is awful for both addicts and those close to them, - it should never have been invented.'

The complementizer *som* controls NEUTER SINGULAR agreement on *grusomt* 'awful',[11] and the personal pronoun *det* 'it' is also NEUTER SINGULAR.

Default agreement is determined by factors extraneous to the controller. As Wechsler (2013) points out, pancake sentences involve logical metonymy (Pustejovsky 1995): the nominal phrase is not being treated as a normal one. One can question whether this is appropriately termed "semantic agreement". As in §3.2.1, we have two ways forward. We can say that the Norwegian agreement pattern is quite different, and we need to complicate the typology of alternative agreements. Or we say:

(i) The distribution of agreements fits the simple constraint of the Agreement Hierarchy pattern (as in (4));

(ii) the mismatch fits logically into the pattern shown in **Figure 3**;

(iii) there are further comparable examples, referenced in §4.4.5.

Therefore, again, we adopt generalized semantic agreement (as in (8)), as the more parsimonious account.

The Norwegian data are helpful for understanding the Hierarchy of Agreement Sources. Often, as in §3.2.1, the two sources are contiguous on the hierarchy. But this need not be the

[11] *Som* is uninflectable, but when it has a normal antecedent, an agreeing adjective in its clause shows gender and number.

case. In our Norwegian examples above, we have the ordinary morphosyntactic specification overridden by an extraneous source (rightmost on the hierarchy). We can also examine the source contiguous on the hierarchy, namely "complex nominal construction":

(14) *Norwegian* ((Bokmål, Hans-Olav Enger, personal communication)
Magnus Carlsen og Bobby Fischer hadde vær-t **super-t**.
Magnus Carlsen and Bobby Fischer had be-PST.PTCP super-**SG.N**
'Magnus Carlsen and Bobby Fischer would have been wonderful.'

The interpretation is that having them play chess would have been wonderful. We see that extraneous agreement does indeed override the contiguous type, as well as other sources on the Hierarchy of Agreement Sources.

3.3 Intuitions captured by the Hierarchy of Agreement Sources

We now have a Hierarchy of Agreement Sources (**Figure 2**), and our analysis rests on the mismatches between the specifications available from these different sources. On this basis we can formalize generalized semantic agreement, to include novel instances as well as the old core of semantic agreement. The Hierarchy of Agreement Sources allows us to capture two intuitions about semantic agreement: (i) it is based on form-meaning mismatches (§3.3.1); and (ii) it implies additional information content (§3.3.2). To the extent that these intuitions are valid, they are covered by the hierarchy.

3.3.1 Form-meaning mismatches

Lexical hybrids can often be understood as resulting from a **form-meaning mismatch**. Their lexical semantics includes information which is relevant to the agreement features. English *family* is SINGULAR in form, and its morphosyntactic specification is SINGULAR. But it denotes a plurality of individuals. Crucially, its lexical semantics is relevant to the agreement feature **NUMBER**, in a way not available for ordinary nouns. Hence *family* is a hybrid while *dog* is not. *Family* shows a form (SINGULAR) versus meaning (PLURAL) mismatch (see the extended discussion of hybrids in Corbett 2015). It is reasonable to consider constructional mismatches in a similar way. For instance, conjoined SINGULAR nominal phrases have SINGULAR form, but denote a plurality, hence we find a form-meaning mismatch.

Can this be generalized? The Polish data analysed in §3.2.1 show a mismatch between the morphosyntactic specification of a single paradigm cell vs the specification of the lexeme as a whole. We might think of this as a **form-form mismatch**. It is then tempting to think of the remaining examples as showing **meaning-meaning mismatches**. There is something in this, in that in extraneous agreement, the feature values often contribute additional information, as we see in §3.3.2.

3.3.2 The contribution of agreement feature values

This Hierarchy of Agreement Sources (**Figure 2**) implies a scale parallel to it, which measures what the agreement contributes, through the feature values involved. The scale runs from the canonical baseline (agreement is redundant)[12] through increasing degrees of information-addition (which further characterizes the referent) up to instances where agreement is the prime source of certain information. The comparison here is between the morphosyntactic specification of the controller and the information available from the feature values shown by agreement.

Consider again the Polish examples in §3.2.1. When agreement follows the specification of the particular cell in the paradigm it is fully redundant. In the interesting situation where there is a mismatch between the specification of the particular cell (SINGULAR, LOCATIVE, MASCULINE/NEUTER) and the more general morphosyntactic specification (SINGULAR, FEMININE), as in (11), it is the latter which provides information useful for establishing the anaphoric link. We know that anaphora does not use **CASE**. Therefore a FEMININE pronoun provides the information allowing *ręka* 'hand' to be identified as a possible antecedent. Moving to the familiar examples of lexical hybrids, the mismatch is between morphosyntactic specification and lexical semantics. Here the contrast is between the essential morphosyntactic specification (SINGULAR for *family*) and the lexical semantics (which includes the information that *family* involves a plurality of members). Use of PLURAL agreement adds a small degree of information, since the speaker characterizes the referent as a plurality. When the two sources of agreement specification are different parts of the nominal phrase, the contribution of agreement is greater; thus with conjoined phrases, PLURAL agreement can indicate a semantic plurality even though there is no PLURAL conjunct. Finally, the greatest contribution of agreement is in those instances where it is extraneous to the controller. For instance, in Norwegian pancake sentences, the only overt indication of the appropriate ("pancake") interpretation, the logical metonymy, comes precisely from the agreement.[13] Hence this scale, parallel to Hierarchy of Agreement Sources, runs from redundant agreement, contributing no additional information, through the familiar agreement with hybrids and constructional mismatches, through to examples of extraneous sources where agreement provides information not directly available from the controller.

4 Key phenomena: varieties of generalized semantic agreement

To demonstrate the value of the new version of the constraint (9), we tackle the full range of examples. I present constructions involving agreement alternatives which are interestingly

[12] In the canonical instance, agreement information matches information unambiguously available from the featural specification of the controller. Yet canonical agreement need not be functionally redundant: it may allow identification of the syntactic subject, for example.

[13] There can be covert pancake sentences, when the subject is NEUTER SINGULAR (Corbett 2022b: 207); hence, although agreement can be the only overt indicator, it is not an essential indicator.

different. These have been described and analysed previously, sometimes at length. For current needs, I give a brief description of each, an analysis showing why one agreement alternative represents generalized semantic agreement, and I indicate key *references* where fuller details can be found. The order is taken from the Hierarchy of Agreement Sources (**Figure 2**) and **Figure 3**.

4.1 Split hybrids

Split hybrids have proved invaluable in demonstrating the need to generalize semantic agreement, since they fit the constraint of the Agreement Hierarchy and they fit within the pattern of competing sources of agreement information. I revisit briefly the Polish data, and point to similar examples (§4.1.1), and then revisit a poster child for the Agreement Hierarchy and argue that it can be fruitfully reinterpreted as a split hybrid (§4.1.2).

4.1.1 Polish, Scottish Gaelic and Old Frisian split hybrids

The Polish example examined in §3.2.1 above represents a particular type of split hybrid, which is worth situating within the typology of hybrids. Lexical hybrids can be split in various ways. English *family* is a hybrid in the SINGULAR only; there are no special effects with the PLURAL *families*. This follows from the English feature system, since there are no further contrasts to invoke. On the other hand, Serbo-Croat (hbs)[14] *gazda* 'landlord, boss', is a gender hybrid in the PLURAL only; it is MASCULINE in the SINGULAR, but MASCULINE and FEMININE in the PLURAL. This is despite the fact that the feature system would allow it to be a hybrid in the SINGULAR too, since **GENDER** is distinguished in both SINGULAR and PLURAL (Corbett 2006: 215–216, 2015: 205–207, Despić 2017, Puškar 2018, and Franks 2020: 448–464). Polish *ręka* 'hand' is even more restricted, since its hybrid behaviour is restricted to the LOCATIVE SINGULAR (and there, to one of the overabundant possibilities). The irregular form controls MASCULINE/NEUTER agreement within the nominal phrase. In the personal pronoun we find FEMININE agreement (from the lexical gender of the noun). This mismatch between the morphosyntactic specification of a single cell and that of the paradigm is subsumed by generalized semantic agreement. This example is significant, and deserves more detailed investigation.

This analysis of split hybrids makes sense, since by default we associate featural information with lexemes (normal nouns), unless this information is overridden at the sub-paradigm level (Serbo-Croat *gazda* 'landlord, boss'), unless in turn overridden at the level of individual cells (Polish *ręka* 'hand'). The *reference* here is Corbett (2022a: 60–61, 78–82), where fuller detail

[14] In accord with the 2017 'Deklaracija o zajedničkom jeziku' (http://jezicinacionalizmi.com/deklaracija/), I treat Serbo-Croat (hbs) as a pluricentric language, like English or German, with four standards: Bosnian (bos), Croatian (hrv), Montenegrin (cnr), and Serbian (srp); in ISO terms it is a macrolanguage. Corbett & Browne (2018) offer a linguistic outline, and Bugarski (2012; 2019 and references there) discusses the complex sociolinguistic background and language status.

can be found, also for the comparable data on Scottish Gaelic *muir* 'sea'. The next logical type, where more than one cell of the paradigm is involved (but not a complete subparadigm, such as the whole plural), is found in Old Frisian (Fleischer & Widmer 2016, discussed in Corbett 2022a: 71–74, 78–79).[15]

4.1.2 Serbo-Croat covert adnumerative

While data on Polish *ręka* 'hand' are limited, there is extensive information on our next example, and it fits the Agreement Hierarchy particularly well. The interesting construction involves Serbo-Croat nouns of the first inflection class (which are MASCULINE), being governed by a lower numeral (*dva* 'two', *tri* 'three' and *četiri* 'four'). The loss of the DUAL number, followed by various readjustments, has left a complex picture here. There are two synchronic challenges: the form of the noun and the agreements. The noun stands in a form identical to the GENITIVE SINGULAR. However, it does not take GENITIVE SINGULAR agreements. We might label it as ADNUMERATIVE, with a rule in the inflectional morphology to realize this specification as identical to the GENITIVE SINGULAR (as glossed in (15)). The possible agreements are: (i) a form equivalent to the NEUTER PLURAL, and (ii) the MASCULINE PLURAL:

(15) *Serbo-Croat* (Bosnian variant, Leko 2010: 106)

Dv-a	drug-a	su	trča-l-a	/	trča-l-i	zajedno
two-M/N.NOM	friend(M)-SG.GEN	AUX.3PL	run-PST-**PL.N**	/	run-PST-**PL.M**	together

'Two friends ran together.'

The distribution of these agreements is evidenced in two corpus studies (**Table 1**). Sand (1971: 55–56, 63) took texts mainly from Serbia, including many newspapers texts; Leko (2000) used the Oslo Corpus of Bosnian texts (1990s, around 1.5 million words).

	attributive	**predicate**	**relative pronoun**	**personal pronoun**
Serbian texts Sand (1971)	[0%]	18% (n = 376)	62% (n = 32)	[100%]
Bosnian texts Leko (2000)	1% (n = 507)[16]	42% (n = 259)	56% (n = 52)	100% (n = 18)

Table 1: MASCULINE PLURAL agreement with MASCULINE nouns governed by lower numerals in Serbo-Croat.

[15] In some of these instances, attributive modifiers are the only target still showing syntactic agreement; such targets at the bottom of the Agreement Hierarchy, and their relation to grammaticalization, are discussed further by Enger (2022).

[16] Leko records six plural attributive modifiers, but these are the frozen modifier *nekih* 'some', which is GENITIVE PLURAL, and not strictly relevant (2000: 268).

Table 1 gives the percentage of MASCULINE PLURAL agreements from the total of PLURAL forms.[17] For completeness, it includes percentages within "[ ]" for the positions where Sand gives no data (since there is essentially no choice). Leko's count has few personal pronouns since subject pronouns can be dropped. As we move rightwards, we see a clear monotonic increase in the likelihood of the MASCULINE PLURAL. How should we interpret these data? Nouns have a full paradigm of **CASE** and **NUMBER** distinctions. The additional possibility, the ADNUMERATIVE, leads to agreement alternatives just for MASCULINE nouns (of the main inflectional class); there are thousands of these, unlike the restricted examples in §4.1.1. There are two agreement alternatives: the unusual one, the NEUTER PLURAL, induced just by this cell of the paradigm, or the one we would expect from a morphosyntactically MASCULINE noun (namely MASCULINE PLURAL). Thus we have again a mismatch between the specification of a single cell, and that of the lexeme, and it is the latter which counts as generalized semantic agreement (as in **Figure 3**). *References* include Leko (2000) and Corbett (2006: 208–209).

4.2 Lexical hybrids

There are numerous lexical hybrids (see lists in Corbett 2006: 213–220 and Croft 2013: 101; the latter is particularly useful on the types of difference covered under syntactic vs semantic agreement). Here I mention just a few examples. In general, it is relatively easy to see the mismatch involved. We noted that hybrids like English *family* and *committee* have the morphosyntactic specification SINGULAR, but their lexical semantics allows them to be characterized as plural, since multiple individuals are implied.[18] A well-known example which is hybrid in respect of **GENDER** is Russian *vrač* 'doctor'; the form gives the morphosyntactic specification MASCULINE, and when the doctor is female, this implies FEMININE, and we find both MASCULINE and FEMININE agreement. This hybrid, one of a large group, is significant since it allows FEMININE agreement even in attributive position (Corbett 2006: 210). Less familiar are examples from Bantu languages where we find, for example, a gender value restricted to humans, which expands to take in non-human animals: the change runs step by step through different agreement targets, as documented by Wald (1975). A further interesting example is the alternative agreements of human versus diminutive in Chichewa (nya, Corbett & Mtenje 1987). There are numerous *references* on lexical hybrids, and ways into this considerable literature include Corbett (2015; 2022b).

4.3 Complex nominal constructions

These are varied and interesting, particularly for the different sources of agreement information which they offer. They are widespread; three types are discussed below, with conjoined nominal phrases being an especially well-studied source of Agreement Hierarchy effects.

[17] The predicate is occasionally SINGULAR, as is much more common with higher numerals; I omit four such examples from Leko's figures, for comparability with Sand's count.

[18] Pollard & Sag (1994: 71) give **A new committee have been constituted.* Here the use of plural agreement would characterize the controller in a way inconsistent with the semantics of the verb.

4.3.1 Reduced quantitative noun / headedness mismatch

This type is common, as in English *this group of people **are** friendly*. There is a mismatch between the agreement requirement of the syntactic head *group* and the semantic head *people.* The directionality is evident from the fact that PLURAL agreement involves the semantic head and therefore represents generalized semantic agreement. Corbett (2022b: 198–199) argues that such constructions are intermediate to lexical hybrids, since nouns like *group* can take PLURAL agreements without a dependent phrase (hence can behave as lexical hybrids) but the PLURAL is more likely when there is a dependent phrase, and hence we have a complex nominal construction. *References* can be found in Corbett (2022b), recent work on Bulgarian can be found in Stamenov (2022), and a Russian example is analysed in the context of triple agreement alternatives in §5.1.

4.3.2 Reduced qualitative noun / headedness mismatch

We illustrate reduced qualitative nouns from Romanian (ron), starting from (Croitor 2013). Most interesting for our purposes are those where the syntactic head is inanimate:

(16) *Romanian* (Alexandru Nicolae, personal communication)
O / *un bijuterie de rucsac a fost
INDF.SG.F / *INDF.SG.M jewel(F) of backpack(M) has been
expus-ă / **expus** de producător la târg
shown-SG.F / shown[SG.M] by manufacturer at fair
'A jewel of a backpack was exhibited by the manufacturer at the fair.'

The two nouns have different gender values. We see that in attributive position, agreement must be with the syntactic head *bijuterie* 'jewel', which is FEMININE. The predicate, however, can agree either with the syntactic head, or with the semantic head *rucsac* 'backpack' (MASCULINE).[19] We now look at the remaining target types:

(17) O bijuterie de rucsac care a fost ***expus-ă** / **expus**
INDF.SG.F jewel(F) of backpack(M) REL has been *shown-SG.F / shown[SG.M]
de producător la târg ...
by manufacturer at fair ...
'A jewel of a backpack, which was exhibited by the manufacturer at the fair ...'

The relative pronoun *care* does not show **GENDER** directly, but we can see its values from the predicate agreeing with it. Here only the MASCULINE is possible. The demonstrative pronoun must also be MASCULINE:

[19] Following the famous pattern of Romanian, MASCULINE agreements are syncretic with the NEUTER in the SINGULAR, and with the FEMININE in the PLURAL. The example in Croitor (2013) has a NEUTER noun; a MASCULINE is substituted here.

(18) Acesta /*Aceasta se vinde bine.
it.SG.M /*it.SG.F REFL sell well
'It is selling well.'

This distribution (syntactic agreement in attributive position, syntactic or semantic in the predicate, and only semantic for pronouns) is in accord with the Agreement Hierarchy. We see that the alternatives involve agreement with the syntactic head, or with some other element (the semantic head, as appropriate for reference tracking), and the latter alternative is analysed as generalized semantic agreement (**Figure 2**). *References* are: Hulk & Tellier (1999) on French and Corbett (2006: 222–223).[20]

4.3.3 Conjoined nominal phrases

Conjoined nominal phrases typically present agreement alternatives. The first source of agreement specification is one of the conjuncts (usually the nearest); this type is often called partial agreement, and is like agreement with an ordinary nominal. The second option is to have access to all conjuncts; this type is called resolution, since within the construction there is a calculation of feature values. This type is higher on the Hierarchy of Agreement Sources since it occurs within the complex nominal construction. In the easiest cases, number resolution will give the value PLURAL (see Corbett 2006: 238–263 for a fuller range of possibilities). Thus, in a sentence like ***This** man and woman **were** building a new home, this* shows syntactic agreement, while *were* represents generalized semantic agreement. There are robust Agreement Hierarchy effects (in Russian, for example, Corbett 1983: 158–159, 2006: 220–221). Some languages allow semantic agreement even in attributive position, as in this Bulgarian (bul) example:

(19) *Bulgarian* (Hristov 2021: 118)
vaš-i-te ime i famili-ja
your-**PL**-DEF.**PL** name(N)[SG] and surname(F)-SG
'your name and surname'

Hristov (2021: 118–119) reports 60 hits for exactly this phrase on the web, while the alternative *vašeto* 'your' (NEUTER SINGULAR), agreeing with just the nearer conjunct, is considerably more frequent (603 hits). Understanding resolution as a type of semantic agreement has been proposed from the start of work on the Agreement Hierarchy (Corbett 1979: 206–208, and see Dammel 2015 for discussion), though this equivalence has been challenged (Johnson 2013). Within the

[20] Another type of headedness mismatch is found in the possessive adjectives of Slavonic, especially the remarkable constructions of Upper Sorbian (hsb). The possessive adjective may control agreement (rather than the head of the nominal phrase) according to the scale: attributive < relative pronoun < personal pronoun. Thus, the possibility for the possessive adjective to control agreement follows the Agreement Hierarchy, except that the predicate is excluded (for reasons partly similar to those found with the Polish data in §3.2.1); see Corbett (1987: 318–322).

scheme of **Figure 3**, conjoined nominal phrases fit well. *References*: for recent discussion of resolution and semantic agreement see Thorvaldsdóttir (2019) on Icelandic, and An & Abeillé (2022) on French. For comitative phrases, which are related to conjoined noun phrases, see Corbett (2022b: 200–201).[21]

4.4 Extraneous agreement

We now analyse five phenomena where the source of one of the agreement alternatives is not within the controller, but is extraneous to it (Corbett 2022b). These phenomena would not fit straightforwardly under the term "semantic agreement", hence "generalized semantic agreement" is preferable here.

4.4.1 Associative agreement

Associative agreement is unusual. While associative marking on nouns occurs frequently, providing the additional sense of 'associates and colleagues', it is rare to have this sense dependent on the agreement. We find it however in dialects of Russian, notably the Talitsk dialect:

(20) *Russian* (Talitsk dialect, Bogdanov 1968: 69, his transcription is transliterated)

moj	brat	tam	toža	**žy-l´-i**
my[**SG**.M.NOM]	brother(M)[**SG**.NOM]	there	also	live-PST-**PL**

'my brother (and his family) also lived there'

Note first that the noun is unchanged; the associative effect is seen only in the agreement. And second, the data available are all in accord with the Agreement Hierarchy in that we find straightforward SINGULAR agreement within the noun phrase, and PLURAL agreement outside it (in predicate position and with the personal pronoun). The first two target types are illustrated in (20); Bogdanov shows PLURAL agreement of the personal pronoun, but as yet we have no examples with the relative pronoun. The two sources of agreement are the morphosyntactic specification of the controller, and the extraneous PLURAL agreement, indicating that it is not merely the individual denoted that is involved but also associates (family members or others who the hearer can be expected to identify). This extraneous source induces generalized semantic agreement. There are few *references* here: these include Bogdanov (1968), Skitova (1989), Ivancova (2016: 9) and brief discussion in Corbett (2022b: 202–204), where other languages with the construction are listed.

[21] Conjoined noun phrases prove significant, since this construction interacts readily with other constructions involving agreement alternatives. For example, when hybrid nouns are involved as conjuncts, their lexical semantics can have an effect; see the interesting data pointed out by Megaard (1976: 95), taken up by Wechsler & Zlatić (2003: 171–196), and discussed in Corbett (2022b: 209–210). Thus the mismatch in **Figure 3**, in the constructional mismatches column, between information provided by the lexical semantics and the complex nominal construction, is indeed a necessary part of the account.

4.4.2 Pragmatic use of number: honorific agreement

This instance of extraneous agreement proves significant for our discussion. Here is an example:

(21) *Russian* (19th century) (Turgenev *Nakanune* ch. 30, 1860)
Mamenʹk-a **plač-ut**
mother.DIM-SG.NOM cry-3**PL**
'(Your) mother is crying' (literally 'are crying')

In (21) the honorific effect is due to the agreement; the noun has no indication of politeness. The Agreement Hierarchy is observed, since we find SINGULAR agreement of the attributive, and PLURAL agreement elsewhere (any attributive modifier in (21) would be SINGULAR, while the predicate is PLURAL in (21) and we find the PLURAL also in personal pronouns; see Corbett 2022b for examples). The question of semantic agreement is particularly interesting. One could argue that there is one individual involved, and hence SINGULAR would be the semantically justified form. On the other hand, these agreements follow the pattern of the Agreement Hierarchy, and this fact points the other way.[22] An analysis based on the sources of agreement information resolves the dilemma. One source is the featural specification of the controller (SINGULAR, FEMININE); the other is the extraneous honorific effect, which requires PLURAL. As required by the Hierarchy of Agreement Sources, it is the latter which counts as generalized semantic agreement, and the pattern then fits the Agreement Hierarchy.

There are special conditions for the use of this honorific agreement; it does not simply signal politeness, rather "… it is primarily used for respected persons the speaker has an in group relationship with: if there is too much "horizontal distance" it is not used." (Houtzagers 2018: 1). *References* for this unusual construction are Houtzagers (2018), Corbett (2022b) and Astafyev (2022).

4.4.3 Pragmatic use of gender

Just as **NUMBER** can be used for pragmatic effect, so can **GENDER**. This has been long established: for instance, in Konkani (kok, Miranda 1975: 208–213), in Polish dialects (Zaręba 1984–85, Corbett 1991: 100–101), in Lak (lbe, Corbett 1991: 24–26, following especially Khaidakov 1963: 49–50, 1980: 204–213) and in French (Cabredo Hofherr 2020: §3). And just as with **NUMBER**, we find Agreement Hierarchy effects with this pragmatic use of **GENDER**. Recent studies on German varieties and dialects have added interesting data to the picture, particularly on the specifics of when these effects are employed. The German issue concerns female personal names, in those varieties where personal names take the definite article, such as *dat Anna* 'Anna (literally the. SG.N Anna)'. There is great variety between the dialects, and change is in progress. For our

[22] Discussing somewhat different data involving honorificity, Popović (1991) contrasts semantic and honorific agreement.

purposes, it is significant that there are contrasting systems (Nübling, Busley & Drenda 2013: 158–159). Using a cloze test, Busley & Nübling (2021: 43) found in the Ripuarian dialect that the article was normally NEUTER, while the pronoun showed 8.5% use of the FEMININE (n = 401). In contrast, they report (2021: 48, 50) only FEMININE articles in the Central Hessian dialect of Mardorf, with the pronoun mainly NEUTER (77%, n = 74). Busley & Fritzinger (2021: 133–142) suggest how the extreme systems of article and pronoun agreements, as well as the intermediate ones, may have arisen. The intermediate systems show the situation discussed earlier (recall (7), where the same feature values have different effects in different systems). The conditioning factors can include the age and status of the referent, and the relation of the speaker to her. The contrasting sources are the morphosyntactic specification of the controller, and the extraneous pragmatic gender, the latter being generalized semantic agreement. As noted above, these can vary between dialects. *References* on this include Piepers & Redl (2018), as well as the papers already cited.

4.4.4 Back agreement

In the original Agreement Hierarchy paper, it was noted that: "This Latin evidence is particularly important as it shows alternative agreements of a quite different type to those discussed up to this point, yet it fits perfectly with the agreement hierarchy." (Corbett 1979: 206). It is true that it fits the pattern well, but it was not clear why it should fall under the constraint. It is worth revisiting the data. The phenomenon is found in copula constructions, where agreement is controlled by the nominal predicate rather than by the subject.

(22) *Latin* (lat, Terence, quoted by Kennedy 1955: 117)
Amant-ium ir-ae amor-is integrati-o **est**.
lover-PL.GEN quarrel-PL.NOM love-SG.GEN renewal-SG.NOM COP.PRS.3**SG**
'The quarrels of lovers are the renewal of love.' (literally 'is the renewal of love')

In (22), the SINGULAR predicate noun *integratio* 'renewal' upstages the usual controller (the subject) and the copula *est* 'be. PRS.3SG' is SINGULAR. The same effect can be found with the relative pronoun:

(23) *Latin* (Livy, quoted by Kennedy 1955: 156)
Theb-ae, **quod** Boeoti-ae caput est.
Thebes(F)-PL.NOM REL.**SG.N**.NOM Boeotia-SG.GEN capital(N)[SG.NOM] COP.PRS.3SG
'Thebes, which is the capital of Boeotia.'

The relative pronoun *quod* is NEUTER SINGULAR: it agrees with NEUTER SINGULAR *caput* 'capital', head of the nominal predicate, *Boeotiae caput* 'capital of Boeotia', instead of with its FEMININE PLURAL antecedent *Thebae* 'Thebes'. The anaphoric pronoun regularly agrees with the nominal predicate (in this example *vera pietas* 'true piety'):

(24) *Latin* (Mountford 1938: 64)

Ea	ver-a	est	pietas
that.**SG.F**	true-SG.F.NOM	COP.PRS.3SG	piety(F).SG.NOM

'That is true piety.'

The attributive normally shows agreement within its phrase, as expected. Textbooks suggest that a copular verb *may* agree with a nominal predicate (22); the relative *frequently* agrees in this way (23) and the anaphoric pronoun *normally* does (24). This pattern follows the Agreement Hierarchy. The full picture is more complicated; a fine source is Pinkster (2015: 1261–1262, 1278–1282), giving extensive data and discussion.

The distribution fits the target positions which constitute the Agreement Hierarchy uncannily well, but why? It is not to be understood in terms of feature values, since our three examples alone oppose a fair range of feature values. We have a conflict between the featural specification of the normal controller and extraneous featural information (that of the nominal predicate). That is covered by the Hierarchy of Agreement Sources (**Figure 2**), with the prediction that the feature values of the extraneous source will count as extended semantic agreement, and this is what we find. The main *reference* is the important grammar noted earlier (Pinkster 2015: 1261–1262, 1278–1282). For pointers to other languages with back agreement see Corbett (2022b: 205–206).

4.4.5 "Pancake sentences"

The importance of "pancake sentences" for the argument was discussed in §3.2.2. Key *references* include Enger (2004), which has careful discussion of semantic agreement in this construction, Enger (2013) and Haugen & Enger (2019); Corbett (2006: 223–224) makes the link to the Agreement Hierarchy, while Corbett (2022b) provides references to other languages with the construction. For a survey of the literature, see Åkerblom (2020).

4.5 Summary: varieties of extraneous agreement

We have analysed five different examples of extraneous agreement; these included types that had been found problematic as instances of semantic agreement. But each had a mismatch of sources of agreement information, with one being extraneous to the controller, and all five conform to the Agreement Hierarchy. Analysing these phenomena on the basis of the Hierarchy of Agreement Sources, with the extraneous source giving rise to generalized semantic agreement, allowed us to fit each of them into the larger typology.

5 Ordering more than two agreement possibilities

A simple opposition of syntactic and semantic agreement is inadequate when there are more than two agreement possibilities. The Hierarchy of Agreement Sources comes into its own, since it

gives relative rankings. I first present the situation where a single controller has properties which are sufficient to account for there being more than two agreement possibilities (§5.1); then we look at those where we find agreement of rather different types (§5.2).

5.1 More than two agreement possibilities induced by the same controller

We start with the case where the different possibilities can be pinned on the same controller. A good example here is Russian *rjad*, which literally means 'row, series', but is frequently used as a vague quantifier 'number'. As a quantifier, it typically takes a phrase in the GENITIVE PLURAL, for instance *rjad voprosov* 'a number of questions'. Such phrases permit three agreement alternatives. The original noun *rjad*, the syntactic head, is of MASCULINE gender, and MASCULINE SINGULAR agreement can be found also when it is used as a quantifier. Quantifiers in Russian often take NEUTER SINGULAR agreement (which may be analysed as a default, showing a failure to agree); we may therefore analyse the NEUTER SINGULAR as resulting from the lexical semantics of this item, in its use as quantifier; hence the NEUTER shows greater generalized semantic agreement than the MASCULINE SINGULAR. Quantified expressions typically also allow the semantic head to be the source of agreement, giving rise to PLURAL agreement, which is the third possibility (resulting from the complex nominal construction). The three alternatives, which I have just ordered according to the Hierarchy of Agreement Sources, are all found in the Russian National Corpus. We now ask how they are distributed according to targets. In attributive position we find only the MASCULINE SINGULAR, as in expressions like *cel-yj rjad vopros-ov* 'a whole-SG.M number of question-PL.GEN'. In the predicate we find all three possibilities. In a corpus of around two million words of newspaper texts, Graudina, Ickovič & Katlinskaja (1976: 25–26) found 87 examples, with the distribution of agreements given in **Table 2** (they consider the minority NEUTER SINGULAR form to be non-standard). In the relative and person pronoun positions, we normally find PLURAL agreement.

attributive	**predicate (n = 87)**	**relative pronoun**	**personal pronoun**
MASCULINE SINGULAR	MASCULINE SINGULAR: 79% NEUTER SINGULAR: 6% PLURAL: 15%	PLURAL	PLURAL

Table 2: Agreement with Russian quantitative phrases with *rjad* 'number'.

Thus we can arrange the three agreement possibilities according to the Hierarchy of Agreement Sources, and their distribution conforms to the constraint of the Agreement Hierarchy, as **Table 2** shows.[23]

[23] In literary texts (19th and 20th centuries), we find MASCULINE SINGULAR predicate agreement with *rjad* 'number'. When comparable items like FEMININE *čast'* 'part' are included, the SINGULAR is still clearly favoured (85% of 254 examples); see Krasovitsky, Brown, Corbett, Baerman, Long & Quilliam (2009), under: quantifier > non-numerical quantifier > noun of indeterminate quantity'.

There are other examples that appear somewhat similar, since the possibilities stem from the controller:

(i) Swedish (swe) examples like *facket* 'the trade union', pointed out by Hans-Olav Enger (p.c. 13.01.2021) following Hagåsen (1992). These nouns can take NEUTER SINGULAR (the original gender), or "common gender" (the shared MASCULINE/FEMININE form), or else they can behave like *committee* nouns and take the PLURAL, giving three options in all;

(ii) Serbo-Croat *deca* 'children', which has four possibilities, FEMININE SINGULAR, NEUTER PLURAL, MASCULINE PLURAL and FEMININE PLURAL (Corbett 1983: 76–93, 2023, Wechsler & Zlatić 2003: 50–60, 206–219, 2012, Hristov 2021: 60–102 passim);

(iii) numeral phrases in Qafar (aar, Hayward & Corbett 1988: 269).

5.2 The combination of agreements of different types

We now turn to instances where we find a combination of agreement phenomena, including at least one where the source is extraneous (it cannot be located in the controller). For example, in 19th century Russian we find titles used for polite address and polite reference such as *prevosxoditel'stvo* 'excellency'.[24] With it we can find no fewer than four possible agreements, that is, all the gender/number possibilities that Russian allows: MASCULINE SINGULAR, FEMININE SINGULAR, NEUTER SINGULAR, and PLURAL. However, these are somewhat different in nature. In origin, *prevosxoditel'stvo* 'excellency' is an abstract noun of NEUTER gender; NEUTER SINGULAR is the morphosyntactic specification of this noun. The straightforward alternatives are FEMININE SINGULAR when used of a woman, and MASCULINE SINGULAR when used of a man, the possibilities allowed for by the lexical semantics of this title.

What then of the PLURAL? We find instances of PLURAL agreement to show respect in 19th century Russian. However, this does not depend on the presence of a title; honorific agreement and titles are independent of each other. First, this honorific agreement can occur with ordinary nouns such as kin terms, as we saw in §4.4.2. This shows that the use of PLURAL agreement is a further option when titles are used, in addition to the choice in **GENDER**. Second, the use of a title for politeness does not require the use of honorific agreement. The conditions on its use, given earlier, are interesting: "… it is primarily used for respected persons the speaker has an in group

[24] I concentrate on the majority of these titles, those based on abstract nouns of NEUTER gender. I leave aside others, like *svetlost'* 'grace', since the original noun is of FEMININE gender, and thus the possible agreements are reduced. See Pišković (2011: 229–231) for Serbo-Croat titles, including *Veličanstvo* 'Majesty', which has three possible gender agreements. As with Russian, in a given instance the choice in gender is between the noun's original gender on the one hand, and MASCULINE or FEMININE on the other (depending on the individual addressed or referred to). Pišković provides data on all four Agreement Hierarchy positions.

relationship with: if there is too much “horizontal distance” it is not used.” (Houtzagers 2018: 1). For instance, a maid would use it for members of the household who she would see regularly, while an outsider would not. For fuller discussion see Corbett (2022b). The agreements are as follows (examples with relative pronouns are rare, hence the lack of data in **Table 3**):

attributive	predicate	relative pronoun	personal pronoun
NEUTER SINGULAR	NEUTER SINGULAR FEMININE SINGULAR MASCULINE SINGULAR PLURAL	FEMININE SINGULAR*	FEMININE SINGULAR MASCULINE SINGULAR PLURAL

Table 3: Agreement with titles in 19th century Russian.
*I have just one example of a relative pronoun, which is FEMININE. I predict that examples with MASCULINE SINGULAR and PLURAL were also possible.

The key point is that we have alternatives in **GENDER**, similar to that for other lexical hybrids, and on top of that a choice in **NUMBER** which is extraneous to the particular noun heading the controller. The source for this PLURAL agreement, for signalling politeness of a particular type, is extraneous to the controller. Hence we can arrange the agreement possibilities in order of by the Hierarchy of Agreement Sources: NEUTER SINGULAR, then MASCULINE or FEMININE SINGULAR agreement (depending on the referent), and finally PLURAL agreement, since this extraneous agreement signals politeness. Thus, again, the degrees of generalized semantic agreement match the agreements according to the Agreement Hierarchy, and this is a substantial step forward.

6 Levels of generalization

Getting to grips with semantic agreement requires generalizations at different levels, and recognizing these levels has taken time. To understand why, let us take a step back and consider the related issue of **CASE**. We accept that a value can have different functions. Traditionally we talk of the “subjective genitive” and the “objective genitive”, in nominalizations for example. The case value genitive maps to two different functions. But equally a function may map to different case values: we might find subjective nominative and subjective dative, as well as the subjective genitive.

Returning to our problem of agreement, we distinguish between the feature **NUMBER** and its values SINGULAR, DUAL, PLURAL and so on; and the feature **GENDER** with values FEMININE, MASCULINE, NEUTER and so on. Analogously to subjective dative case, we can talk of semantic feminine gender, as in German *das Mädchen … **sie*** ‘the.SG.N girl … she’. And this is logical, if we are interested exclusively in agreement in **GENDER**. We use “semantic” to specify one use of the FEMININE gender value, just as we might use “subjective” to specify one use of the genitive case value. However, since we find more general effects, we wish to generalize over different

agreement features, and to refer to semantic or syntactic agreement. Moreover, when we talk of subject, we recognise that there are different types of subject; and so, when necessary we specify further, as with "passive subject", for instance. This is the logical step to take also with semantic agreement: there can be "pragmatic semantic agreement", "honorific semantic agreement" and so on. Thus semantic agreement further specifies a choice between feature values, and pragmatic or honorific further specify semantic agreement.[25] The different types of agreement, like pragmatic agreement, have long been recognized (§4.4.3). And just as the term "subject" is more appropriate or less so in different constructions, so semantic agreement is a more obviously suitable term for examples like feminine agreement with *Mädchen* above, and less obviously suitable for the honorific use of agreement. Hence the term "generalized semantic agreement".

But we still need to go further. Lexical hybrids are found frequently, and they have tended to dominate research. Hence the feature values (FEMININE versus NEUTER, for example) attract attention. But the feature values and their semantics are the symptoms of our problem. If we stay at this level, then semantic agreement does not generalize. When we compare Norwegian pancake sentences (§4.4.5) we find another level of generalization, in that we contrast the exceptional case default (NEUTER SINGULAR) with normal agreement (various values of **NUMBER** and **GENDER**). And in back agreement (§4.4.4) we have simply two sets of values of **NUMBER** and **GENDER**. The true generalization is that we find different, potentially mismatched, sources of agreement feature values, and this mismatching holds across the range. Hybrids are included in this generalization: the mismatch is between their morphosyntactic specification and the feature values implied by their lexical semantics. The fact that these may differ in just one feature value should not mislead us: there are two sources, they just happen to be structurally closer and featurally less distinct than in examples of extraneous agreement. Once this is recognized, all of these phenomena can then be covered by the constraints on generalized semantic agreement.

7 Conclusions

We have analysed the means for generalizing over agreement alternatives. While "semantic agreement", in contrast to "syntactic agreement", covers the core of what is needed, there is a wider range of alternative agreements to be encompassed. We find examples like Polish *ręka* 'hand', specifically its LOCATIVE SINGULAR form *ręku*, where neither alternative involves semantics in a straightforward way. At the other extreme we find instances where the choice is driven more by pragmatics (as with honorific agreement) than semantics. These examples share an underlying unity with the core instances of semantic agreement: they involve the same morphology as other agreement, and are all subject to the Agreement Hierarchy. I showed that

[25] And in an interesting account of Eegimaa, (Sagna 2019) distinguishes human semantic agreement and locative semantic agreement.

they all arise from different sources of agreement information which mismatch. The possible mismatches allow us to set up a Hierarchy of Agreement Sources, and hence to predict – even for the phenomena which are less obviously semantic in nature – which source will give rise to generalized semantic agreement. In turn, this allows us make predictions as to possible agreement patterns, according to the Agreement Hierarchy (and it aligns with the idea that monotonicity of mappings is an overarching constraint on variation, Graf 2019). Our account generalizes to instances involving more than two agreement alternatives.

This reworking of the constraint of the Agreement Hierarchy, taking a canonical perspective, is part of a trend in contemporary typology. We examine and justify the underpinnings of a proposed typology, and relate them to the underlying attributes of the domain (Round & Corbett 2020). In doing so, we take on board advances in related typological disciplines, demonstrating that linguistics is normal (social) science (Spike 2020, Himmelmann 2022). Since doubts were first expressed about the nature of semantic agreement, it has taken many years to offer a way forward: new data, some “less semantic” than semantic agreement, and some “more semantic”, have been key. And the prospects are inviting: the interactions of the various instantiations of generalized semantic agreement deserve fuller investigation, and with larger corpora now available, and more sophisticated elicitation techniques, exciting new research in this area has become possible.

Appendix: Alternative terms for “semantic agreement”

Several terms are in use. We start from the common pair **syntactic** vs **semantic** agreement (Corbett 2006: 155–160). The motivation for these terms is that syntactic agreement (as in *family has lost* …) is the form that straightforward rules of syntax would give rise to. *Family* is SINGULAR in form, it can denote a unit, and hence we find SINGULAR agreement. Semantic agreement implies access to additional information: in this instance the lexical semantics. *Family* denotes a plurality of individuals, and access to this lexical information gives rise to semantic agreement (*family have lost* …). This pair of terms - syntactic and semantic agreement - is widely used; see among many Leko (2000), Hahm (2010), and Sagna (2019), who all use the terms in their titles.[26] There are several alternative terms (most were recorded in an often-cited list in Corbett 2006: 155), which I discuss briefly (see **Table 4**).

The traditional Latin terms “ad formam” ‘according to the form’, and “ad sensum” ‘according to the sense’ (noted in Corbett 1991: 225–226) are still used, as is the Greek “synesis”, for semantic agreement. In ‘according to the form’, we should not take ‘form’ literally, but rather this is agreement according to the feature value that the form would predict. For instance, the forms of a noun may demonstrate that it belongs to a particular inflection class, and being in that class may then give a prediction as to gender value.

syntactic agreement	**semantic agreement**	**references (representative examples)**
ad formam	ad sensum	Classicist usage
formal	semantic	Wurmbrand (2017) Sigurðsson (2019)
formal	referential	Rappaport (2014: 354)
grammatical	semantic	Fleischer (2012)
grammatical	notional	Quirk et al. (1985: 757) Pinkster (2015: 1243–1244, 1287–1301)
grammatical	conceptual	Köpcke, Panther & Zubin (2010: 174)
morphosyntactic	semantic	Kathol (1999: 241)
morphological	semantic	Shen (2019), Smith (2021)

Table 4: Alternative terms for syntactic and semantic agreement.

“Ad formam” and “ad sensum” can be taken forward as “formal” and “semantic”, and that gives a reasonable opposition, as in Steele’s definition of agreement (1978: 610): “The term *agreement* commonly refers to some systematic covariance between a semantic or formal property

[26] The range of languages is also wide: see for instance Chumakina (2014) on Archi, Landau (2016) on Modern Hebrew and Van de Velde (2022) on Bantu languages.

of one element and a formal property of another." "Formal" is also paired with "referential", which works well for some examples, but is inappropriate for honorific agreement (discussed in §4.4.2 and §5.2). It also works less well for instances of semantic agreement within the nominal phrase (as in Russian *naša vrač* 'our (female) doctor' §4.2). "Grammatical" is often used instead of "syntactic", but it is not ideal: agreement is a topic often discussed in prescriptive terms, which can give "grammatical" an unwanted sense; moreover, syntactic and semantic agreement can both be grammatical in linguists' use of the term. "Grammatical" is opposed not just to "semantic", but also to "notional" and "conceptual". Finally, I note two more pairings with "semantic", namely "morphosyntactic" and, most recently, "morphological".[27]

There is a subtle distinction in the use of these terms, and elucidating it will take us forward. Moreover, if readers take one or other position for granted, being aware of the distinction will aid in appreciating more of the literature. Consider the examples in **Table 5**.

	Mary has agreed	***The family has agreed***	***The family have agreed***
Terminology 1	(normal)		semantic agreement
Terminology 2	(normal)	syntactic agreement	semantic agreement

Table 5: Alternative systems of terminology for syntactic and semantic agreement.

According to Terminology 1, *Mary has agreed* and *The family has agreed* both show normal agreement, the form that the basic rules of syntax would produce, and so they need no special term. There is a special term (generalized) semantic agreement or equivalent, only for instances like *The family have agreed.*[28] This approach makes good sense, but it has a weakness: if there is nothing special about *the family has agreed*, nouns like *family* are treated as normal (and misrepresented in dictionaries and tagged corpora). We need to flag (i) that *family* does not have a consistent agreement pattern (Corbett 2012: 85–88); (ii) that *the family has agreed* is in opposition to a second agreement possibility. Having an opposing term (such as syntactic agreement) solves this. This mean that, whichever of the agreement alternatives appears, the agreement is more significant than that found with canonical items, which always take the same agreements.

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[27] There are other terms which are specialized for gender agreement, such as "grammatical" and "natural", as in Murphy, Puškar & Guzmán Naranjo (2018). As mentioned earlier, we wish to generalize across the features (Löbel 2013), and so "natural" is not ideal for our purposes (see also Audring 2009: 17n2 for discussion). Dahl (2000) raises issues with semantic agreement regarding GENDER, critiqued in Johnson (2014: 39–40); Dahl suggests "lexical" and "referential" gender would be preferable terms, but this does not carry over to the full range of agreements we need to cover (as laid out in §4).

[28] This approach is found in the Classical literature; the basic account is the "three concords" (normal syntax), and examples where more is needed are treated under "construction according to sense" (semantic agreement), or under attraction (see, for instance, Smyth 1920: 258–259). Similarly, Huddleston & Pullum (2002: 499, 501) have "simple agreement" and "semantically motivated overrides".

In Terminology 2, *Mary has agreed* shows normal agreement. In this instance, agreement according to form and to meaning would give the same outcome, and the fact that this often obtains is a reason why agreement systems can function. The other two possibilities are in opposition, hence each requires a term, namely *The family has agreed* shows syntactic agreement (or equivalent) and *The family have agreed* is an instance of (generalized) semantic agreement. I believe that this is the more common approach (as in, for instance, Corbett 2006:155–159, and compare Croft 2022: 133). In the account above, generalized semantic agreement arises from a mismatch between two sources of agreement information. Given the mismatch, it is significant whichever agreement alternative appears. Hence Terminology 2 provides the more consistent fit with our analysis.

Abbreviations

1, 2, 3: first, second, third person, ACC: accusative, AUX: auxiliary, COMP: complementizer, COP: copula, DEF: definite, DIM: diminutive, F: feminine, GEN: genitive, LOC: locative, M: masculine, N: neuter, NOM: nominative, PL: plural, POSS: possessive, PRS: present, PST: past, PTCP: participle, REL: relative, SG: singular.

Data availability

The data can be accessed directly in the paper or in the sources referred to.

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The author has no competing interests to declare.

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