

Gradience in morphosyntactic features

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1 Structure of the argument

As Einstein nicely put it: ‘Everything should be made as simple as possible, but not simpler.’ It would be good to have a simple typology of the morphosyntactic features. And if Zwicky (1986: 988-989) is right in suggesting that there is a fixed list of available features and values, then a simple typology is an attainable goal. However, when we examine how features and their values can be established for given languages, gradience appears to be a major challenge. One common response to this challenge is to propose additional feature values; as we shall see, this response would rule out a simple typology. I argue that this approach fails: additional values cannot account for gradience. This means that we can still work towards the ideal of a simple typology. Thus for this paper, gradience looms large as a possible obstacle to a different goal. Gradience is an obstacle, which might suggest that we were heading for the ‘simpler’ situation, the one that fails to recognize the true complexity of the problem. I will show that this apparent obstacle is not directly relevant, allowing us still to work towards a typology which is indeed ‘as simple as possible’.

2 Establishing morphosyntactic features and their values

If we take the notion of a ‘fixed list’ seriously, we must have criteria to establish a language’s inventory of features and values. We shall concentrate on the morphosyntactic features, those relevant to syntax (gender, number, person, case, definiteness and respect). We leave aside features which are morphosemantic, as for instance aspect frequently is (see Stump 2005, Corbett forthcoming, for discussion); these features are morphosemantic in the sense of being relevant to semantics and to morphology without affecting syntax. There are some languages for which establishing the inventory appears to be a trivial task, and others for which there have been long-running debates. For each, we need to have criteria. Arguably the most principled attempts are due to the Set-theoretical School, notably Zaliznjak (1973). See van Helden (1993) for a detailed account of this work, and Meyer (1994) for an enlightening review of van Helden, which gives a clear view of the issues which were the focus for the group. Simplifying greatly, they iterated through possible lexemes and possible contexts to achieve the minimum number of distinctions, each of which was recognized as a feature value. Set-theoretical accounts are ‘brittle’, since one new lexeme or one new context can undermine an analysis. This is *positive* in terms of falsifiability.

Conversely it may be seen as *negative*, since morphosyntactic feature systems are less rigid than such analyses allow.

3 Gradience: the problem

Gradience is a major problem for most suggested criteria for determining morphosyntactic features and their values, including for set-theoretical approaches. This is shown by hybrids (controllers whose feature specification varies according to target). The familiar example, *committee*, is singular for attributives:

- (1) this committee / *these committee

Yet in some varieties it can be plural for other targets:

- (2) the committee has decided ... / the committee have decided ...

This is a problem for not just for set-theoretical approaches but also for almost any constrained approach to morphosyntactic features. Example (2) shows that *committee* does not fit straightforwardly as singular, nor as plural. Contexts that otherwise distinguish clearly between singular and plural, fail to do so in this instance. Members of the Set-theoretical School were aware of the issue, but did not fully resolve it.

4 The extent of the problem

The problem is indeed substantial. First, lexical hybrids are numerous; some examples are given in (6) below, and many more can be found in Corbett (2006: 213-220). Second, the example cited above involves NUMBER, but other features occur too, notably GENDER (as in (6) below). Third, similar instances of gradience go beyond lexical hybrids to include constructional mismatches, for instance, conjoined noun phrases (see Corbett 2006: 220-224 for constructional mismatches). And fourth, comparable assignment problems affect government (as in the Russian nominative-instrumental, Zaliznjak 1973: 62). Thus lexical hybrids and constructional mismatches are too common and too important to be ignored when discussing the justification of features and values.

5 Additional feature values: an inadequate proposal

Several researchers tackle the problem of hybrids by introducing an additional feature value, to maintain categorical values. Thus English would have COLLECTIVE alongside SINGULAR and PLURAL, and nouns like *committee* would have the feature value COLLECTIVE (or perhaps CORPORATE). This strategy fails for three reasons, each concerning gradience. *First*, the behaviour of such a value is

unlike that of other values: COLLECTIVE gives variable agreements, while other values are rigid. *Second*, this gradience is severely constrained, and yet the constraint on the instances of gradience needs to refer only to the values SINGULAR and PLURAL. To see this we start from the Agreement Hierarchy (Corbett 2006: 207):

(3) The Agreement Hierarchy

attributive > predicate > relative pronoun > personal pronoun

Given this hierarchy, we can constrain possible agreement patterns:

- (4) 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.

Here is one example:

(5) Agreement with *committee* nouns (Levin 2001: 109)

	verb		relative pronoun		personal pronoun	
	<i>N</i>	% plural	<i>N</i>	% plural	<i>N</i>	% plural
US (spoken)	524	9	43	74	239	94
GB (spoken)	2086	32	277	58	607	72

The US data are from the Longman Spoken American Corpus (LSAC), which has five million words, and GB data come from the ten million word section of the British National Corpus (BNC) devoted to spoken language.¹ Attributive position is not included, since only singular agreement is found there, see example (1). The remaining data are clearly in accord with the constraint given. As pointed out earlier, the constraint is stated in terms of the main values, PLURAL versus SINGULAR, and does not make reference to COLLECTIVE.

To demonstrate that the familiar English example is representative of many others, consider the following summary data from a range of languages (details can be found in Corbett 1991: 226-236, 2006: 214-218).

¹ Since the relative pronoun does not mark number, Levin examined his substantial data and confirmed that singular verbs are normally found with *which*, and plural with *who*. He then counted relative pronouns as singular or plural in this way, rather than establishing their number each time from the verb. Since relative *that* allows greater choice he included predicates of *that* within the predicate count. These decisions blur the picture somewhat, but Levin gives explicit information to allow others to recalculate and reinterpret his results (2001: 32-3, 55-60).

(6) The Agreement Hierarchy: a sample of the evidence from gender

	attributive	predicate	relative pronoun	personal pronoun
Chichewa diminutive for human	class 12	class 12	class 12	class 12 / (CLASS 1)
Serbian/Croatian/Bosnian <i>d(j)evojče</i> 'girl'	n	n	n	n / F
Polish <i>lajdaki</i> 'wretches'	non_m.pers	non_m.pers / M.PERS	M.PERS	M.PERS
Konkani young females	f	N	no data	N
Russian <i>vrač</i> 'doctor' (female)	m / (F)	m / F	(m) / F	(m) / F
Serbian/Croatian/Bosnian <i>gazde</i> 'bosses'	f / (M)	(f) / M	((f)) / M	M

Notes: 1. lower case indicates syntactic agreement, and upper case SEMANTIC AGREEMENT

2. parentheses indicate a less frequent variant

Each of the hybrids listed conforms to the constraint of the Agreement Hierarchy. For each the constraint is stated in terms of the main feature values, and not in terms of a special additional value analogous to COLLECTIVE.

The *third* reason why the strategy of introducing an additional feature value fails is that there is substantial variation *between* lexical items. This can be seen from these data (see also Bock, Cutler, Eberhard, Butterfield, Cooper Cutting and Humphreys 2006: 98):

(7) Predicate agreement with different hybrids (Levin 2001: 65)

	<i>Independent</i>		<i>The Guardian</i>	
	<i>N</i>	% plural	<i>N</i>	% plural
<i>team</i>	145	37	100	38
<i>family</i>	173	37	100	28
<i>committee</i>	137	9	100	3
<i>government</i>	365	5	100	0

Here the data are taken from two British newspapers. The first is a straightforward count of a sample from the *Independent*, the second (*The Guardian* taken from Hundt 1998: 82) involved counting till 100 examples had been identified. Both counts demonstrate considerable variation between the items. Thus we cannot

resolve the issue of hybrids by adding just one feature value. Each hybrid would require its own value, producing an explosive increase. Had it worked, this approach would have wrecked any chance of a fixed list. We must therefore allow substantial gradience, but model it with a restricted set of feature values. That is the key point.

6 Gradience of targets

There is an interesting effect in the comparison of American English and British English data in (5) above. The differences between the varieties are not attributable just to the controllers. To show why this is unusual we need to survey earlier accounts of hybrids. We know that the likelihood of the competing forms of agreement depends on the position on the Agreement Hierarchy. Further, that there are differences between controllers. Beyond that, there are a few instances where we have data for the same controllers across some other variable. One of these is the large investigation into Russian usage (Panov 1968), which included a relevant section on agreement, written by I. P. Mučnik. This is also reported in Kitajgorodskaja (1976) and discussed in Corbett (1983: 30-39). For that study there is data on age of speakers, place where they had spent the largest part of their life, education and profession. Speakers were asked to report what they would say in four examples, when referring to a woman (the examples have letters to key them to Figures 1-3):

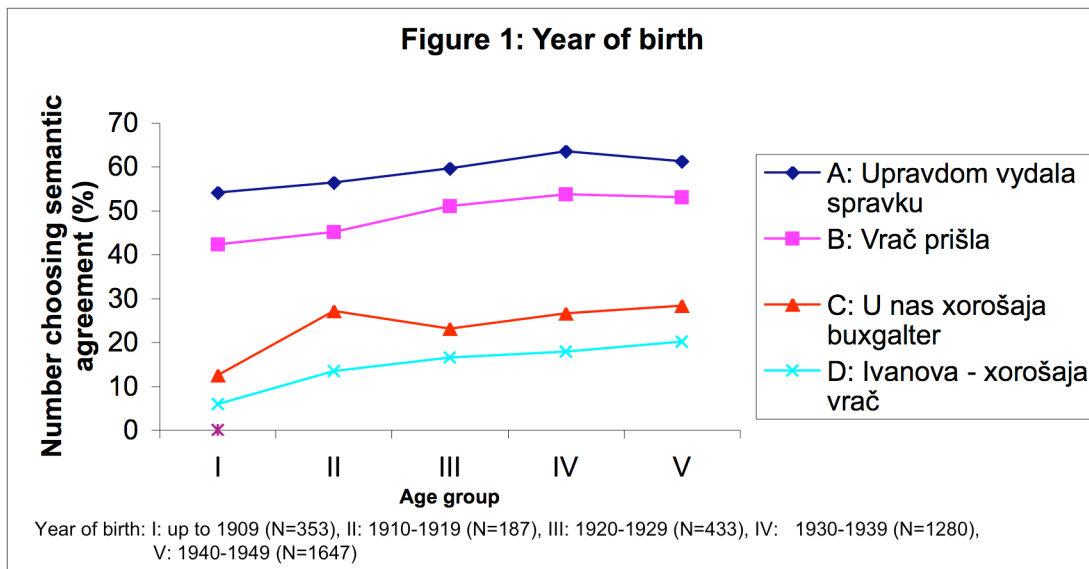
- (A) upravdom vyda-l spravku /
house_manager issue-PST[M.SG] certificate
‘the house manager issued (M) a certificate’ /
upravdom vyda-l-a spravku
house_manager issue-PST-F.SG certificate
‘the house manager issued (F) a certificate’
- (B) vrač priše-l / vrač priš-l-a
doctor come-PST[M.SG] doctor come-PST-F.SG
‘the doctor came (M)’ / ‘the doctor came (F)’

Examples (A) and (B) both show predicate agreement.

- (C) u nas xoroš-ij buxgalter /
at us good-M.SG accountant
‘we have a good (M) accountant’ /
u nas xoroš-aja buxgalter
at us good-F.SG accountant’
‘we have a good (F) accountant’

- (D) Ivanova - xoroš-ij vrač /
 Ivanova good-M.SG doctor
 ‘Ivanova is a good doctor /
 Ivanova - xoroš-aja vrač
 Ivanova good-F.SG doctor
 ‘Ivanova is a good (F) doctor’

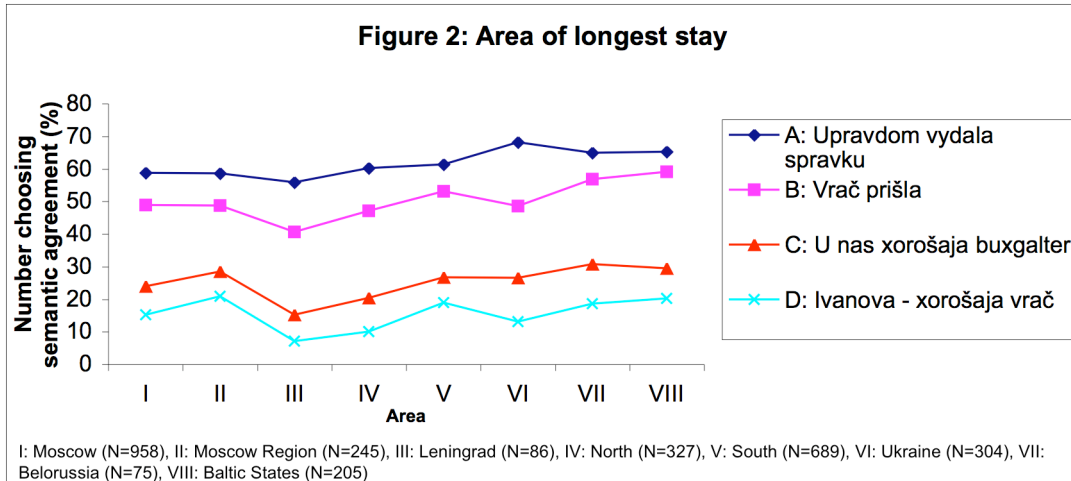
In contrast, (C) and (D) show attributive agreement. In both positions, both types of agreement are found. We consider the distribution of the different agreements, in terms of three representative variables.



Based on data in Panov (1968: 25-40) and Kitajgorodskaja (1976)

In Figure 1 we have data on three lexical items, *upravdom* ‘house manager’, in example A, *vrač* ‘doctor’ (examples B and D), and *buxgalter* ‘accountant’ (example C). Judgements were sought for the situation in which the referent is a female. In this situation, in principle both masculine and feminine agreements are possible. The feminine represents semantic agreement. We see that we find a considerably higher proportion of semantic agreement (feminine) in the predicate (examples A and B) than in attributive position (examples C and D). This is in accord with the Agreement Hierarchy. For both hierarchy positions we have data on two lexical items, and there is a clear difference between them. Figure 1 also gives data on age, and we see that there is a gradual increase in the acceptance of semantic agreement. The general impression is that the effect of the different lexical items is relatively constant. Similarly the effect of age is rather constant; though there is some variation, we see a slight increase, constant across the hierarchy positions and across the different lexical items.

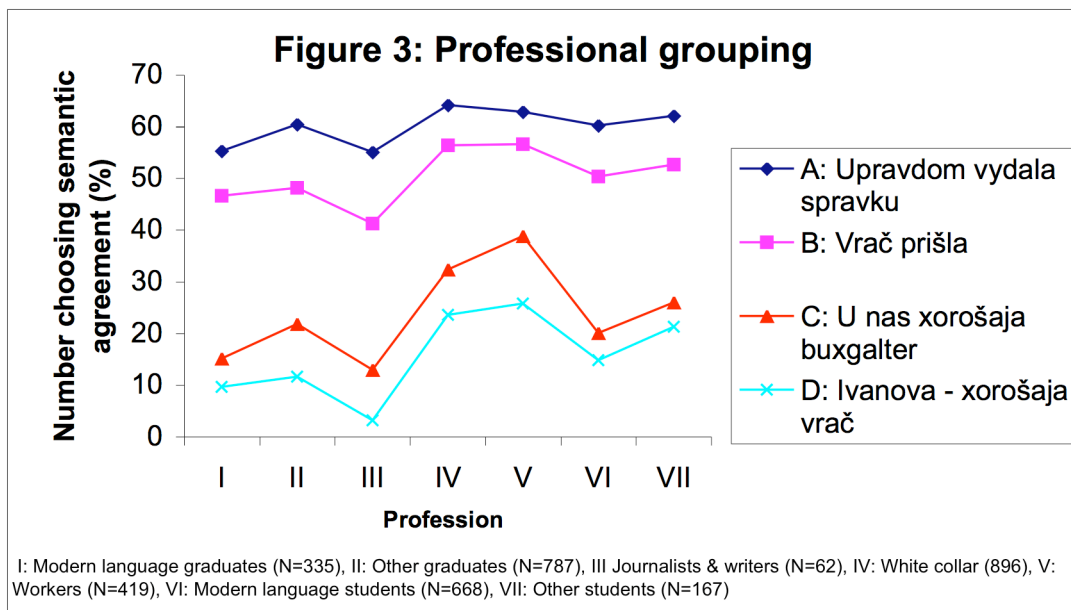
Consider now regional differences, as shown in Figure 2:



Based on data in Panov (1968: 25-40) and Kitajgorodskaja (1976)

Again we see a clear distinction according to the type of target, in accord with the Agreement Hierarchy. There is also a marked effect from the choice of the particular lexical item. Then there are some regional differences with speakers from what was then Leningrad showing the least willingness to use semantic agreement (a trait which Figure 1 shows to be a conservative one). The interaction of the effect of the different factors – syntactic, lexical and sociolinguistic – is relatively straightforward.

Finally let us consider the profession of the speakers (Figure 3):



Based on data in Panov (1968: 25-40) and Kitajgorodskaja (1976)

Here we see a similar picture, with the syntactic constraint of the Agreement Hierarchy clearly in evidence, and a consistent effect of the different lexical items. The profession of the speaker does give rise to variation, and this is more marked for agreement of attributive modifiers than for the predicate.

In each of the three figures, the sociolinguistic effects run in parallel across the Agreement Hierarchy. That is, if a sociolinguistic variable correlates with higher likelihood of semantic agreement, this is true for both attributive modifiers and for predicates. Where data are available, this appears to be generally the case.

It is against this background that we can appreciate the pattern in (5) above. The comparison between American and British English does not follow this pattern just observed. Speakers of these two varieties have different preferences *across* target types. Speakers of American English have lower percentages of semantic agreement for the predicate, and yet higher for pronouns. This means that the gradience across varieties is not just a matter of the lexical semantics of the hybrid controllers, but also concerns the differences between the structural positions on the Agreement Hierarchy.

At this point it is natural to look to the extensive psycholinguistic study of Bock et al. (2006), which contrasts number agreement in British and American English. We must bear in mind that Bock et al. report mainly on special constructions, namely attraction environments. It is nevertheless still striking that they found similar proportions for the use of plural pronouns (both for tag questions and with reflexive pronouns) for British and American speakers (2006: 80-83). The speakers showed considerable disparity with verbal predicates, British speakers showing more plurals than American speakers (2006: 86-89, see also 74-75), and so the lack of a difference with pronouns is surprising. These data are less convincing than those of Levin (2001) who contrasted naturalistic spoken data from two corpora. (Bock et al. 2006: 74-75 also examined corpora, but used only written sources, the Wall Street Journal corpus and part of the British National Corpus in the domain of finance and commerce.) Unfortunately Bock et al. (2006) appear to have been unaware of Levin's work, and so did not specifically address his very interesting result. Thus Levin's surprising data deserve further investigation.

7 Conditions

We now return to the more general issue of gradience raised earlier, and how it is to be addressed given that introducing additional feature values will not solve the problem. As I have argued elsewhere, it is important to distinguish morphosyntactic features from conditions on the use of feature values. Thus, in various languages, agreement with conjoined noun phrases is partly determined

by the word order (controller preceding or following the target) and by animacy (whether the noun phrases refer to animates or inanimates). However, it does not follow that either of these conditioning factors is a morphosyntactic feature (Corbett 2006: 179-181). Similarly there are languages where the value of the number feature depends in part on respect (plural is used to mark politeness). In such languages, we would not propose a respect feature (though there are languages where RESPECT is a proper morphosyntactic feature with a unique realization). Conditions form a part of an account of gradience; these may involve semantic information, down to the detail of particular lexical items.

The semantic information involved is discussed in Joosten, de Sutter, Drieghe, Grondelaers, Hartsuiker & Speelman (2007); they are mainly concerned with Dutch collective nouns, but refer also to the English examples which are comparable.² Taking a cognitive grammar approach, they suggest that collective nouns differ in their conceptual profiling. They contrast *an old club* (the ‘collection’ is old, while the members can be young) with *an old audience*, where it is the members who are old. This suggests that: ‘the member level of club is less easily accessible (i.e., profiled to a lesser extent) than the member level of *audience*.’ (Joosten et al. 2007: 86-87). The important point for our purpose is that there is other evidence, apart from agreement, that nouns of this type differ in their lexical entries. These differences are potentially the basis for the particular conditions on agreement we have proposed here (see Corbett 2006: 176-205 on conditions).

Of course, it must be demonstrated that the otherwise justifiable differences in the lexical entries for collective nouns actually correlate with the pattern of agreement. Joosten et al. (2007) set out to do this for Dutch collective nouns. They consider possibilities of combination (as with age above), which distinguish between the collection level and the member level namely: *eeuwenoud* ‘age-old’, *oprichten* ‘to found, start’, *groot* ‘big’, *jong* ‘young’, *blond* ‘blond’ and *dronken* ‘drunk(en)’. On this basis they propose three groups of nouns. Type 1, those like *vereniging* ‘association’, generally trigger collection level interpretations; a second type, like *familie* ‘family’, readily allow both interpretations; the third type, like *bemannig* ‘crew’, generally trigger member level interpretations. They then examined agreement with these nouns in two large corpora, starting with the Condiv corpus (47 million words) and for the less frequent nouns adding data from the INL corpus (38 million words); details of both can be found in Joosten et al. (2007: 96).

² See Copestake (1995) for ideas on representing such nouns in a computational lexicon.

(8) Agreement with Dutch noun phrases headed by three groups of nouns
(from Joosten et al. 2007: 96)

noun group	means (totals)	verb		relative pronoun		possessive pronoun		personal pronoun	
		<i>N</i>	plural %	<i>N</i>	plural %	<i>N</i>	plural %	<i>N</i>	plural %
high plural agreement (mean B > 50%)	mean A: 37.6% mean B: 70.9%	1527	1.6	173	6.9	195	67.7	270	74.1
medium plural agreement (mean B 50-30%)	mean A: 18.1% mean B: 35.3%	2323	0.3	480	1.5	145	11.7	241	58.9
low plural agreement (mean B <30%)	mean A: 7.9% mean B: 15.2%	2954	0.4	589	1.0	447	4.0	365	26.3

Note: the table has been flipped to be consistent with our other tables, in having the Agreement Hierarchy positions along the top. The nouns are divided into three groups, according to the proportion of plural agreement. Mean A covers all agreements, while Mean B is for possessive and personal pronouns only.

First we can observe how well these data fit the Agreement Hierarchy. For each of the groups of nouns, there is a monotonic increase in semantic agreement. There is even evidence that the possessive pronoun in Dutch can be distinguished from ordinary personal pronouns. Second, it is clear that Dutch differs substantially from English, in that nouns of the type we are discussing allow only occasional instances of plural agreement in the predicate: it is the pronouns which show the main choice. For this reason, Joosten et al. (2007: 96) take the agreement of the possessive and personal pronouns (Mean B) as the basis for dividing their 18 nouns into three new groups (plural agreement over 50%, 30-50% and under 30%). The table shows that they collected a substantial number of examples, and that the differences in agreement must therefore be taken seriously.

The interesting point, of course, is how the groups based on the agreements found will relate to those based on the judgements concerning collection level and member level.

(9) Dutch nouns with percentage plural agreement and type for property distribution (Joosten et al. 2007: 97)

lexical item	plural agreement	type	lexical item	plural agreement	type
<i>duo</i> ‘duo, pair’	86.1%	3	<i>firma</i> ‘firm’	32.4%	1
<i>echtpaar</i> ‘married couple’	79.3%	3	<i>koor</i> ‘choir’	32.3%	1
<i>bemannig</i> ‘crew’	72.0%	3	<i>leger</i> ‘army’	26.7%	1
<i>gezin</i> ‘family, household’	63.6%	3	<i>club</i> ‘club’	25.9%	1
<i>familie</i> ‘family’	58.2%	2	<i>bond</i> ‘union’	20.2%	1
<i>bende</i> ‘gang’	43.4%	2	<i>vereniging</i> ‘association’	14.3%	1
<i>delegatie</i> ‘delegation’	37.7%	2	<i>maatschappij</i> ‘company’	12.1%	1
<i>team</i> ‘team’	34.6%	2	<i>comité</i> ‘committee’	9.2%	1
<i>publiek</i> ‘public’	33.1%	3	<i>regering</i> ‘government’	7.7%	1

The percentage for plural agreement is for all targets combined (but recall that the verb is almost always singular with such controllers in Dutch). The types are those described above, with type 1 being those which generally trigger member level interpretations.

The fit between the classification according to properties and that based on agreement is good. High member level accessibility correlates with high plural agreement.³ There is one item that is out of line, namely *publiek* ‘public’.⁴

Joosten et al. (2007) also conducted an eye-tracking experiment. Participants were asked to read examples with collectives of the different types followed by pronouns. There was some evidence that texts which involved a collective noun

³ This result is reconcilable with the suggestion in Bock et al. (2006: 101) that the differences in the comparable English construction depend on stored lexical information. From Joosten et al. (2007) we take the point that the stored information is not simply stored information about agreement. There is a similar result in Bock et al. (2006: 84), who asked 120 speakers to judge whether the referents of phrases headed by a collective represented ‘one thing’ or ‘more than one thing’. They found that there were ‘consistent, significant differences in the notional ratings that paralleled the pronoun results, but again, no differences between the British and American speakers.’ (2006: 84). Thus this approach helps with the difference between lexical items, but not with the difference between varieties.

⁴ A speculative suggestion is that the behaviour of *publiek* ‘public’ may be linked to another condition, namely the cardinality of the group. It is established that for numeral phrases, the higher the cardinality, the lower the likelihood of the phrase controlling plural predicate agreement. This links to individuation, since the larger the group the less individuated the members (Corbett 2000: 214-217).

of the type which generally triggers collection level interpretations together with a plural pronoun took longer (required more processing time) than those with a singular pronoun (Joosten et al. 2007: 108). The authors are rightly cautious about these results (Joosten et al. 2007: 110).

We should note that conditions are themselves severely constrained, in that they must have consistent effects across constructions and across languages (Corbett 2006: 181-183). That is, they are required always to have similar effects. Thus, for instance, word order as a condition was noted above with reference to conjoined noun phrases. The particular effect is that controllers preceding the target are more likely to control semantic agreement in number than those following. The general constraint is that precedence must always work in this way: any condition invoking precedence and semantic agreement must always have this linkage (the reverse is excluded).

8 The Canonical approach

This general approach fits well with the Canonical approach in modern typology (Corbett 2005, 2006, 2007, Seifart 2005, Suthar 2006). In this approach we set up clear definitions (as those in the Set-theoretical School did), and take them to the logical end point, defining a theoretical space before asking where particular examples fit into it. Canonical morphosyntactic features follow two overarching principles: having dedicated forms, and permitting a simple interface to syntax. These principles cover ten criteria specifying how particular features and their values deviate from canonicity. These criteria define a theoretical space, one which accommodates hybrids (Corbett forthcoming). In the problem just discussed, our definitions (specifically our definitions of feature values) will be based on controllers which take consistent agreements. Hybrids are then non-canonical. Furthermore, particular feature values in a given language may be more canonical or less canonical. While in this way we avoid the explosion in the number of feature values, we leave open the possibility that a particular feature might have some values which are certain, and further values of less certain status (a classic instance is the Russian case system; see, among others, Zaliznjak 1973, Comrie 1986, Mel'čuk 1986/2006, Corbett forthcoming).

9 Conclusion

I have considered variance particularly for its relevance to the typology of morphosyntactic features. Variance offers a considerable challenge, such that we might wonder whether any typology was in fact breaking the requirement of 'not simpler'. That is, by attempting to specify a typology, we would be making things simpler than they could possibly be, since additional values would be needed to handle the various types of hybrid and constructional mismatches. However, we have seen that the challenge of variance is not answered by proposing additional

feature values. It follows that we can retain the possibility of a typology which makes things as simple as possible, essentially a fixed list. That is the main conclusion. The approach to gradience which I outlined fits within the Canonical approach to typology. It combines the categorical nature of feature systems (as in set-theoretical approaches) with the gradience found with many controllers (lexical hybrids and constructional mismatches). The regularities within the gradience are captured by the combination of hierarchies and conditions.

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