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Rethinking agreement: Cognition-to-form mapping

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Abstract: The prevailing assumption is that an agreement feature originates in one linguistic element, that is a controller, and is copied onto another one, a target. This form-to-form approach encounters massive difficulties when confronted with data, such as missing controllers or feature mismatches. A cognition-to-form mapping approach is proposed instead, suggesting that agreement features, such as person, number, and gender, are associated with referents in the cognitive representation. They serve to specify referents on either notional or conventional grounds, and are thus referential features. Referential features are mapped onto various sites in linguistic structure, including inflections. Parallel agreement between various sites is observed, as a side effect of mappings from the same cognitive source. Languages differ in which and how many sites for marking referential features they require. Analysis of Russian evidence suggests that the cognition-to-form mapping approach has a much greater explanatory force than the traditional form-to-form approach. There are only peripheral classes of instances in which form-to-form agreement may be needed as a supplementary factor. In general, the roots of agreement lie in cognitively motivated discourse processes associated with reference.

Keywords: discourse reference, referential features, cognition-to-form mapping, parallel agreement

1 Introduction

The common view of agreement, having emerged over many years in linguistics and presupposed in much of the current literature, is roughly as follows: agreement is a morphosyntactic mechanism of copying features from one verbal unit (controller) to another one (target). For example, in many languages, features

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such as person, number, and gender are copied from a clause subject to the predicate, or from a noun to its attribute. Covariation, or identical selection of features, observed in linguistic structure, is understood as an asymmetric form-to-form relationship between the controller and the target. This view of agreement is quite traditional, see e.g. Paul (1891 [1880]: 339–356); according to Haspelmath (2013: 207) it was in place already in the sixteenth century. Abstracting away from minor differences, the traditional form-to-form copying view of agreement has been conveyed in various ways in studies such as those by Steele (1978), Lehmann (1982), Moravcsik (1988), and Wechsler (2011), *inter alia*.

But how do we know that the causal link is actually between the two forms? Co-occurrence does not necessarily mean that there is a cause-effect or control relationship. Perhaps there is an external cause that leads to the appearance of one and the same feature on two different sites, just like two or several similar sprouts appear in the garden at the same time because it has become warm outside. Below we will see that a common external cause is actually what lies at the root of agreeing forms.

During the past few decades, a number of important studies appeared that pointed out difficulties encountered by the traditional approach. A formal controller may be missing or underspecified, or there may be a mismatch in agreement features between the controller and the target. These kinds of issues have been discussed from various perspectives in studies such as Mithun (1986), Barlow (1988, 1991, 1999), Langacker (1991, 2008), Pollard and Sag (1994), Vigliocco and Franck (1999), Bock and Middleton (2011), Croft (2001, 2013), and Haspelmath (2013). All this literature has indicated problems associated with the traditional notion of agreement. Suggestions have varied from reinterpreting this notion within the framework of a particular theory to abandoning it altogether.

However, it seems that all this effort exerted by theorists, typologists, and psycholinguists, has not much affected general practice in linguistics. For example, consider the recent handbook by Fortescue et al. (2017). It is devoted to polysynthetic languages that typically represent more than one argument in the verbal predicate. The problem of missing controllers, very typical of so-called subject-verb agreement in many Indo-European languages, is greatly multiplied in polysynthetic languages. However, this problem is only acknowledged in the handbook in a few places, e.g. Evans (2017: 319), Foley (2017: 814). The controversial term “agreement” is used infrequently (being replaced by alternative terms, such as “pronominal affixes” or “indexing”), but still crops up here and there in the very traditional sense (see Bickel and Zúñiga 2017: 181–184; Givón 2017a: 396; Aikhenvald 2017: 733; or Vajda 2017: 388).

The comprehensive study by Corbett (2006) reviewed all of the major approaches to agreement, including those critical of the notion. While

definitely acknowledging multiple complications associated with agreement, Corbett proposed his own approach that boils down to amending the traditional view. According to Corbett, “there is <...> a strong intuition, captured in the controller-target terminology, that agreement is asymmetric” (2006: 115). In Corbett’s so-called canonical approach (2006: 8–27), there is a core and a periphery of agreement phenomena. In the core, there is canonical agreement: an asymmetric morphosyntactic relationship between an explicit controller and a target with matching features. In the periphery, canonical requirements are relaxed in various ways.

In contrast, this paper is another attempt to challenge the traditional view. Relying on the previous critical studies of agreement, I argue that the understanding of agreement as an asymmetric form-to-form relationship is exaggerated and, in fact, largely misguided. My main point is that, in order to be kept in the lexicon of “basic linguistic theory” (Dixon 2010–2012; Dryer 2006), agreement must be reinterpreted in a *parallel* way: two or more forms agree with each other in certain features because each of these forms relates to a cognitive entity bearing these features. I use the notion of *cognition-to-form mapping* as a way to explain the origin of agreement features in various parts of linguistic structure. Also, agreement is seen as a fundamentally discourse-based, or usage-based, phenomenon, while agreement between syntactic units is seen as a special case of the more general phenomenon. Before proceeding with the main part of this paper, it is useful to mention some of the principal difficulties associated with agreement.

First, agreement morphology is found on a variety of sites, including (but not limited to) attributes, predicates, and pronouns. The closer the distance and the tighter the syntactic relationship between a controller and a target, the more confidently it is interpreted as an instance of form-to-form agreement (Corbett 2006: 19–23). Some authors (e.g. Mel’čuk 1993; Testelefs 2001: 363, 390) contrast agreement in tight syntactic domains to the entirely different phenomenon of “congruence”, found beyond such domains. However, since the agreement features (such as gender, number, and person) are the same, there is a widely held view that marking these features on various sites should be seen as one and the same phenomenon (Siewierska 2004: 121). The boundaries of agreement are thus debatable.

Second, the relationships of targets with putative controllers are problematic, even when we deal with sites of the same kinds. Compare the German clause *sie komm-en* (they come-Pres.3Pl) ‘they come’ and the Latin clause *veni-unt* (come-Pres.3Pl) ‘they come’. The third person plural desinences are very similar (and cognate), but they function differently. While the Latin desinence is referentially self-sufficient and performs reference to a plural third person referent, the German desinence contains the same features but normally only

occurs in combination with a separate NP, such as a pronoun; apparently, it does not perform reference by itself. The German structure is the classical agreement structure, while the Latin structure is problematic – it is not clear what syntactic controller the desinence could agree with. Sometimes a distinction between grammatical and anaphoric agreement is posited (Siewierska 2004: 126; Bickel and Nichols 2007: 232).

Third, agreement inflection is widespread in the world's languages, but unlike some inflectional categories that have obvious semantic potential (e.g. tense or case inflection), agreement inflection often appears functionless. In his encyclopedic study of agreement phenomena, Corbett allotted just about one page to the functions of agreement (2006: 274–275). Apparently, under such an approach agreement is seen as a formal mechanism that has little bearing on language use, but, for some mysterious reason, persists in some languages for centuries and even millennia. Discussions of possible functions of agreement are found in Langacker (1991: 307–312), Siewierska (1998), Barlow (1999: 205), Dahl (2004: Section 9.4), Acuña-Fariña (2009: 417–420). Some authors have proposed differentiating between verbal person/number/gender resulting from subject agreement and corresponding verbal categories with independent semantics, see e.g. Frajzyngier (1985), Urjupina (2001), Urmančieva (2001).

Also, it is known that inflectional agreement morphology is diachronically related to referential devices such as pronouns (Givón 1976; Corbett 2006: 264–269; also cf. Givón 2017b). Still, syntax-oriented accounts of agreement do not associate this phenomenon with reference at all. A big question is whether agreement morphology has lost or still retains its erstwhile referential potential.

Various critiques of the form-to-form approach were often drawing on data from a variety of languages. This kind of argument may suggest that the traditional approach is generally correct, even though certain phenomena in particular languages may be occasionally problematic. In this paper, I choose to broadly address the evidence of one specific language, namely Russian (only sometimes bringing in examples from other languages). This will allow us to analyse evidence of one language in sufficient detail to show that the traditional approach is faulty as a whole. Russian is a good language to explore, as it has ample marking for typical agreement features, including person, number, and gender.¹ That was among the reasons that led Corbett to use Russian as one of the “key languages” in his study (2006: 30–31). Lehečková (2003) demonstrated the particularly profuse marking of gender in Russian. At the same time, the

¹ Literature on Russian agreement is too vast to review it here. Also, this paper is not intended as an exhaustive source on Russian agreement. For rich and useful overviews see Iomdin (1990), Testelets (2001: Ch. VII), Lyutikova (2015) *inter alia*.

claim based on the analysis of Russian is intended as a general one, extending to agreement phenomena across various languages.

In Section 2, I cite a Russian discourse example that I will refer to frequently in the discussion to follow. In Section 3, I outline agreement against the background of the phenomenon of reference, which is important for the subsequent argument. Sections 4 and 5 are devoted to two approaches towards agreement: the traditional grammatical approach and the proposed cognitive approach, respectively. Section 6 lays out multiple classes of instances that support the cognitive approach, and Section 7 discusses several facts, potentially problematic for the cognitive approach. Section 8 summarizes the findings, and conclusions are offered in Section 9.

2 An example

In order to have a convenient source of examples to hand, consider an excerpt from a Russian text. Excerpt (1) contains 25 or so instances of agreement in person, number, and gender. In this excerpt, three individual human referents occur, each signaled by a different kind of underlining: the professor, the editor Berlioz, and Jesus. In addition, the combined referent the editor and the poet occurs a number of times.

(1)²

- a. I opjat' krajne udivi-l-i-s'
and again highly surprise-Past-Pl-RP
i redaktor i poët,
and editor(m.Sg.Nom) and poet(m.Sg.Nom)
- b. a professor pomani-l-ø³ ob-oix k sebe
but professor(m.Sg.Nom) beckon-Past-m.Sg both-m.Pl.Acc to Refl.Dat

² Abbreviations in glosses: Acc – accusative, Conv – converb, Dat – dative, f – feminine, Gen – genitive, Imp – imperative, Int – intensifier pronoun, m – masculine, Loc – locative, n – neuter, Nom – nominative, NPast – nonpast, Pl – plural, Pres – present, Pctl – particle, RP – reflexive postfix, Sg – singular. Note that in Russian nouns number-case desinences also syncretically represent declension class. However, for the sake of simplification I mark gender rather than declension class in the glosses, because there is a rough correlation there, and because attributes inflect for gender, not for declension class.

³ I posit explicit zero morphemes in certain places in the Russian structure – specifically, when a clear agreement-related feature, functionally opposed to alternative features, is found. In particular, the past tense masculine singular ending -ø is opposed to overt feminine, neuter, and plural endings. This -ø ending thus not just conveys an absence of a meaning, but is

- c. i, kogda oni nakloni-l-i-s' k nemu,
and when 3Pl.Nom bend-Past-Pl-RP to 3m.Sg.Dat
- d. prošepta-l-∅:
whisper-Past-m.Sg
- e. “Imej-te v vid-u,
have.1mp-2Pl in sight-Loc
- f. chto Iisus suščestvova-l-∅.”
that Jesus(m.Sg.Nom) exist-Past-m.Sg
- g. “Vid-ite li, professor.”
see-NPast.2Pl Ptcl professor(m.Sg.Nom)
- h. prinužděnno ulybnu-vši-s',
forcedly smile-Conv.Past-RP
- i. otozva-l-∅-sja Berlioz, –
respond-Past-m.Sg-RP Berlioz(m.Sg.Nom)
- j. “my uvaža-em vaš-i bol'š-ie znanij-a,
1Pl.Nom respect-NPast.1Pl your.Pl-Pl.Acc big-Pl.Acc knowledge-n.Pl.Acc
- k. no sam-i po èt-omu vopros-u priderživa-em-sja
but Int-Pl.Nom on this-m.Sg.Dat question-m.Sg.Dat hold-NPast.1Pl-RP
- | | | |
|----------------|----------------|--------------------|
| <u>drug-oj</u> | <u>točk-i</u> | <u>zrenij-a</u> .” |
| other-f.Sg.Gen | point-f.Sg.Gen | view-n.Sg.Gen |
- l. “A ne nado nikak-ix toček zrenij-a!”,
but not needed none-Pl.Gen point.f.Pl.Gen view-n.Sg.Gen
- m. otveti-l-∅ strann-yj professor,
reply-Past-m.Sg strange-m.Sg.Nom professor(m.Sg.Nom)
- n. “prosto on suščestvova-l-∅,
simply 3m.Sg.Nom exist-Past-m.Sg
- o. i bol'še ničego.”
and more nothing

Again the editor and the poet showed signs of utter amazement, but the professor beckoned to them and when both had bent their heads towards him he whispered: “Jesus did exist, you know.” “Look, professor,” said Berlioz, with a forced smile, “With all respect to you as a scholar we take a different attitude on that point.” “It’s not a question of having an attitude,” replied the strange professor. “He existed, that’s all there is to it.” (Mikhail Bulgakov 1967, *The Master and Margarita*, end of Chapter 1)

positively characterized by specific features ‘masculine’ and ‘singular’. Morphological zero is just a technical convention, not affecting the argument in this paper.

The four kinds of underlining mentioned above are used in (1) for various elements associated with corresponding referents, including full NPs, pronouns, and inflections. (1) contains pronominal words ‘he’, ‘they’, ‘we’, ‘your (Pl)’, ‘both’ and ‘(our)selves’ that are marked, in various combinations, for the features of person, number, and gender. (1) also contains multiple verb inflections, marked for these features, including:

- masculine singular \emptyset in lines b, d, f, i, m, n
- plural $-i$ in lines a, c
- first person plural $-em$ in lines j, k
- second person plural $-te$ and $-ite$ in lines e, g.

Finally, (1) contains five attributive phrases, marked with rectangles, in which the attributes are marked for gender and number, as well as case (see footnote 6 below).

3 Reference and agreement

From a functional point of view, major agreement features, that is person, number, and gender, characterize referents or those linguistic expressions that serve as referent mentions. Therefore, in order to understand what agreement is, it is useful to consider agreement against the background of discourse reference. (See Kibrik 2011 for the theory of reference assumed here.)

Reference is mentioning referents, or entities, by means of some formal devices. When referring, speakers typically specify the referent’s features. Feature specification may come with very different degrees of detail. One and the same referent may be mentioned by devices as diverse as *you*, *he*, *Victor*, *the car mechanic*, *our neighbor from downstairs*, *last year’s Santa Claus*, etc. If a referent is introduced into discourse from scratch, speakers typically provide detailed specification. That is when nouns are used for reference, sometimes with additional modifiers, as in the last three examples above. These are lexically full referential devices. However, it is often the case that a referent is privileged in the current discourse, having been activated through recent mention or is otherwise readily available. In such instances, a rather general taxonomy suffices to specify the referent. There are several general taxonomies, apparently most important for human cognition, such as human vs. non-human, interlocutor vs. other, male vs. female, single vs. multiple. It is these kinds of general taxonomies that underlie the grammatical features of person, number, and gender. Below I use the term *referential features*, meaning primarily the features of person, number, and gender.

If only a general taxonomy is specified on a referential device, we encounter devices such as pronouns. Pronouns can be called reduced referential devices as they only come with a small amount of referent specification, and such specification is general. Marking referential devices on pronouns is often analysed in terms of agreement, and referential features are considered agreement features.

Fundamentally, mentioning (=referring) and specifying features are two distinct, albeit interrelated, acts. When I use a pronoun such as *he*, in fact I am doing two different things: (i) mentioning or attending to the referent; (ii) specifying the referent's features 'human', 'male', 'non-locutor'. The symbiosis of these two acts is very habitual, but it is useful to keep in mind that reference per se and agreement are distinct.

Referential features, the same as we see on doubtless referential devices, such as pronouns, are also found on various inflections, in particular in verbal predicates and adjectival attributes. The identity of referential features across these various sites suggests that agreement on inflections and on fully referential devices is related. But do all linguistic elements that are marked for referential features actually preform reference? Opinions on this point differ quite dramatically.

Quite often linguists take the view that agreement morphology is “displaced” (Corbett 2006: 1). This means that referential features are marked not just on referential devices (such as two pronouns in (1c) and one full NP in (1m)), but also on morphological exponents that are not obviously referential (verbal and adjectival inflections in (1c) and (1m)). Indeed, in a language like Russian, the dedicated way to perform reference is by means of nominal expressions, either full or reduced. Predicative words, both verbs and adjectives, serve other functions, so referential features marked on them may be considered displaced.

A radically opposite opinion was voiced by Croft (2001, 2013): “A cognitive-discourse analysis of third person pronouns<...> can be extended to indexes. All indexes refer” (Croft 2013: 114). This latter formulation appears to be an overstatement; for example, in the above discussed German example *sie komm-en*, the desinence does not refer by itself, as one needs a subject pronoun to perform the act of reference (see Kibrik 2011: Section 6.7 for further discussion). Still, agreement inflections *can* be and usually *are* referential. To demonstrate that, let me use a piece of anecdotal evidence. On September 21, 2016, Russian TV news were reporting two events of African American persons shot by police in the United States. When the reporter proceeded with the second case, having taken place in Tulsa, Oklahoma, the following VOS clause was uttered:

- (2) zastreli-l-a Kratčer-a ženščin-a - policejsk-ij
 shoot-Past-f.Sg Crutcher-m.Sg.Acc woman-f.Sg.Nom police.officer-m.Sg.Nom
 ‘the shooting of Crutcher was done by a female police officer’

Listening to this news, I clearly registered an effect of surprise after hearing the first word of (2), the fronted predicate. In the first case reported, the shooter was a male policeman, and more generally the default expectation for a police officer is the male gender. The feminine predicate’s ending was clearly interpreted as referential, evoking a female agent referent and contradicting my expectation. My surprise was resolved after hearing the rhematic subject.⁴ If agreement morphology on the predicate were entirely non-referential and “displaced” no surprise effect would be created by (2). So Croft’s claim is quite grounded: inflections can actually refer. And, in any case, they are marked for referential features.

Languages differ profoundly in the sites where they require the encoding of referential features. For example, Russian nominals, and in particular pronouns, distinguish number and person, e.g. *my* ‘we’ in (1j), and, in the third person, also gender: *nemu* ‘him’⁵ in (1c) is third person masculine singular. Adjectives inflect for number and gender, cf. *drug-oj* ‘another’ (feminine, singular) in (1k).⁶ Finite

4 The mismatch between the genders of the two parts in the compound subject of this clause (*ženščina-policejskij*) is irrelevant here, but it relates to the quite common phenomenon of Russian occupational terms: some of them, whether denoting men or women, are grammatically masculine; see discussion in Section 7 below.

5 For the reader’s convenience, here and below I provide informal English translations whenever I cite Russian expressions from (1). It must be kept in mind, however, that these informal translations do not fully convey properties of Russian expressions and may, occasionally, even be somewhat misleading. For example, English ‘him’ does not differentiate between accusative and dative, while *nemu* is a specifically dative form. Readers are advised to go back to the full technical glossing given in (1), in order to fully appreciate all the grammatical and semantic properties of the cited Russian forms.

6 Russian nominals and adjectivals also inflect for case, expressed in a cumulative way with number, and, in certain instances, with gender and/or person, cf. again the dative form *nemu* ‘him’ in (1c) and the genitive form *drug-oj* ‘another’ in (1k). In syntax-oriented agreement studies, it is often emphasized that case assignment is based on a mechanism different from the assignment of referential features: case is assigned to an NP as a whole and is independently marked on an NP head and on an attribute (Testelefs 2001: 384; Corbett 2006: 123–124; Lyutikova 2015: 46). As a matter of fact, the cumulative expression of case with gender and number in Russian attributes renders this idea of completely different grammatical mechanisms for various features of attributes somewhat shaky. In addition, I argue that referential features also come to various sites independently rather than through form-to-form agreement, so the difference between case and referential features may not be so large after all. But still, case characterizes not referents themselves, but their role in a clause or phrase, and is not a referential feature, so I prefer to leave it for a different study.

verbs inflect for number and gender in the past tense (cf. *prošępta-l-ø* ‘he whispered’ in [1d] – masculine, singular) and for number and person (cf. *uvaža-em* ‘we respect’ in [1j] – first person plural) in the non-past tenses.

Before proceeding with a reference-based theory of agreement, the traditional form-to-form approach is to be assessed in the next section.

4 Agreement as a form-to-form relationship

In example (1), instances that can be interpreted in terms of copying a formal controller’s features onto a target are found in a number of places. For instance, the two pronouns *oni* ‘they’ and *nemu* ‘him’ in (1c) have the same referential features as their respective antecedents in (1b), which is the previous clause within the same sentence; these referential features are third person plural and third person masculine singular, respectively. In line (1f) the predicate *sušęestvoval* ‘existed’ has the same features (masculine singular) as the clause subject *Iisus* ‘Jesus’. In (1j) the attributes *vaši* ‘your’ and *bol’sie* ‘big’ coincide in number (plural) with the head noun *znanija* ‘knowledge’, lit. ‘knowledges’ found in the same noun phrase.

The account of agreement as form-to-form copying is less appealing in other kinds of usages. For example, antecedents of free third person pronouns may appear beyond any reasonable syntactic context, such as in the case of the pronoun *on* ‘he’ in (1n) whose nearest antecedent (*Iisus* ‘Jesus’) is found nine clauses and two sentences back, in the direct speech of a different interlocutor. Positing syntactic rules for such instances is highly problematic.

There are also difficulties associated with inflections, as, for example, in the case of gender and number inflection on the predicate *prošęptal* ‘whispered’ in line (1d). This predicate appears in a clause that does not contain an overt subject. One may want to posit a syntactic zero subject, bearing the features of gender (masculine) and number (singular) that are further copied onto the verb. This kind of solution is, however, quite artificial: one would have to tailor all kinds of syntactic zero morphemes with appropriate combinations of grammatical features. Another way to rescue the form-to-form approach is to allow the controller to be the overt subject of the previous coordinate clause (*professor*). This may help in this particular instance, as an appropriate controller is found within the same sentence (in 1b). But that does not help much: Generally, in Russian an overt subject controller does not have to be present within any reasonable syntactic environment. For example, at a certain point in the same chapter of *The Master and Margarita*, the editor and the poet discuss the

possibility that the professor is a spy, after which the professor presents them with his passport, and Berlioz thinks:

- (3) “Čěrt, vsě slyša-l- \emptyset ”
 devil all hear-Past-m.Sg
 “‘Hell, he overheard us’”

Unlike the English rendering, where the subject pronoun *he* is required, in the Russian clause reference is performed by verb inflection alone, the null ending carrying the same features ‘masculine’ and ‘singular’ as a subject pronoun would.

The same is true of person referential features: quite often their presence in inflection cannot be explained by copying from a syntactic controller. For example, the predicate *priderživaemsja* ‘we adhere’ in (1k) is marked for person and number (first person plural), even though the clause subject *sami* ‘selves’ does not bear the feature of person at all. The predicate *vidite* ‘you see’ in (1g) is marked for second person plural (deferential) in the absence of any subject. The form-to-form analysis is also problematic in the instances of the person and number (second person plural) marking on the verb *imejte* ‘have, keep’ in line (1e): imperative clauses usually do not involve an overt subject that could serve as a syntactic controller of the predicate’s person and number inflection.

A whole gamut of other kinds of instances creating major difficulties for the form-to-form concept of agreement are enumerated below in Section 6, and a summarizing table is provided in Section 8. Overall, among all the instances of putative agreement marking in (1), *only about half* conform to the form-to-form agreement interpretation, whereas for the other half such an interpretation is questionable or impossible. This quantitative breakdown would not change much no matter how large the set of data we examine. As I argue below, the instances where the form-to-form agreement approach does work can as well be accounted for without it.

In many well-known publications (Givón 1976; Bresnan and Mchombo 1987; Barlow 1988; Siewierska 2004; Corbett 2006: 110–112; Croft 2013, *inter alia*), it has become widely held that person/number/gender marking on free pronouns and on inflections should be seen as part of the same domain (even if further divided into subtypes). For example, Siewierska (2004) remarked that “the attempts to distinguish person agreement markers from anaphoric pronouns so far have met with little success” (p. 125) and proposed a scalar taxonomy of agreement forms into pronominal, intermediate (“ambiguous”), and syntactic (pp. 121–127). Moreover, it has been recognized that person/number/gender marking in the presence of an appropriate syntactic controller and those instances in which a formal controller is non-obvious or missing should be treated as instances of the

same phenomenon, even though various scholars were inclined to posit boundaries within this continuum to a different extent.

The recognition of a unified domain in which referential features are marked is reasonable and attractive, but the problem is that such recognition is hard to logically combine with the traditional form-to-form understanding of agreement. Two solutions clearly present themselves. The first solution is to stick to the form-to-form control in the instances of narrow agreement, where a clear syntactic controller is available. What, then, about the instances beyond the narrow agreement, in which there is no appropriate syntactic controller that could serve as the source of referential features? Apparently, we would have to admit that exactly the same features show up for different reasons, that is, semantic or discourse-referential reasons. Such a solution is unsatisfactory, as it fails to explain why identical formal phenomena systematically occur under seemingly distinct circumstances. The opposite solution is to adopt a broad and inclusive understanding of agreement, simultaneously renouncing the form-to-form approach. In this understanding, identical selection of referential features on various sites must be explained by a cause outside of the linguistic structure *per se*. It is this latter approach that I present in the next section.⁷

5 The proposed approach: Cognition-to-form mapping

I adopt a broad understanding of agreement, in which the selection of referential features is viewed as a unified process, independent from minor circumstances, such as presence/absence of a potential syntactic controller, free/bound character of agreeing morpheme, etc. When a speaker intends to mention a referent, s/he has that referent represented in his/her cognitive system. The components of the cognitive system that are relevant in referential processes are attention and activation in working memory. Attending to a referent leads to its activation in the speaker's working memory at a subsequent moment in time; see Kibrik (2011) for details of a cognitively based theory of reference and referential

⁷ In Kibrik (2011), I adhered to the traditional form-to-form concept of agreement, and as a result I had to restrict it to a small minority of instances in which a controller is nearly indispensable, such as a subject NP for English or German predicate person-number inflection. That decision came at a cost, because exactly the same referential features were considered agreement in some instances and were not in others. I now depart from that decision and propose to understand agreement in the broadest way, but that entails the rejection of the form-to-form approach.

choice. Technical details of cognitive processing are beyond the central concerns of this paper; here it suffices to say that, in the case of any mention of any referent, the referent is found in the speaker's current cognitive representation, sometimes informally called below "plane of thought".

In the cognitive representation, the referent is equipped with certain features, including person, number, and gender. These features may be notional or associated with conventional properties of a language's mental lexicon (see Section 6 below). Whenever a language cares about a certain referential feature, it requires speakers to activate it along with the referent; it is "thinking for speaking" in terms of Slobin (1996). In one possible terminology (cf. Levelt 1989), we could say that referents are stored and activated along with the corresponding lemmas in the plane of thought. As the speaker produces a clause containing the referent ("plane of talk"), relevant features are *mapped* onto language-specific sites where these features must be marked in the given language.

For example, consider the pronoun *nemu* 'him' in (1c). As the author of (1) decided to mention the referent 'the professor' in this clause, the relevant values of person, gender, and number were readily available in his cognitive representation of the referent, and were mapped onto the relevant site, thus giving rise to an appropriate pronoun form. Even if someone is inclined towards a syntactic account of *nemu* 'him' in (1c), tracing referential features to the noun phrase *professor* in (1b), one would have to acknowledge some version of the cognitive approach in the case of (1n), where the pronoun *on* 'he' referring to 'Jesus' does not have an antecedent in the syntactic environment. Simply put, the general scheme of agreement on referential devices such as pronouns is this: when a speaker (and an addressee) thinks about referent R, s/he simultaneously knows R's features, and when a decision is made to mention R at a certain point, referential features are taken from the speaker's cognitive representation.

The same holds for agreement on inflections. In some clauses, such as (1d) or (3), the only site where referential features are marked is verbal inflection. The process of feature mapping from the plane of thought onto the plane of talk is shown with a double arrow in Figure 1 that illustrates gender and number marking in (1d).

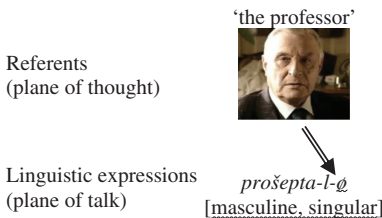


Figure 1: Cognition-to-form mapping of gender and number in (1d).

Of course, it is also quite common that identical referential features appear on more than one site in a clause, as e.g. in (1b) where the features ‘masculine, singular’ covary on the subject and on the verb inflection. From a cognitive point of view, what happens in such instances is that referential features are mapped *in parallel* to both formal devices, as shown in Figure 2.

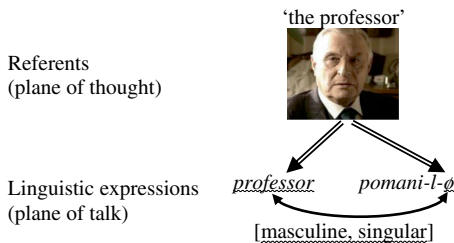


Figure 2: Cognition-to-form mapping of gender and number in (1b).

The features of the inflectional marker and the subject NP are in agreement. That is due not to control from the NP over verbal inflection, but to parallel mapping of the same features from the referent in the cognitive plane. We see here a symmetric, parallel agreement, depicted in Figure 2 with a single double-headed arrow. Agreement is thus understood differently from the traditional controller-target relationship: linguistic forms happen to agree with each other because they receive their features as mapped from one and the same source in the cognitive structure. Agreement understood in this parallel fashion is not a self-contained grammatical mechanism, but a side-effect of the general cognition-to-form mapping.

If it is not form-to-form agreement of a predicate with its subject, why is it that the predicate in a language such as Russian indexes the features of the subject, rather than of something else? In addition to being the syntactically privileged clause participant, subject is also privileged from a cognitive point of view: it is a manifestation of the current focus of attention (Tomlin 1995; Myachykov and Posner 2005; Kibrik 2011: 369, 383). Features of the referent that is focally attended to are, quite naturally, marked on the core element of the clause, that is on the predicate.

An illusion of form-to-form agreement, such as between the predicate and the subject in (1b) emerges from the fact that referential features tend to be associated with those linguistic items that are dedicated referential devices, that is nominals (cf. the opposition between the independent and dependent features in the terminology of A. E. Kibrik 1992 [1977]: 115–116). However, the existence of such association does not prove that the verb gets its referential features from the noun. It may just as well get them from the referent that this noun

corresponds to. Indeed, this is what we have to accept if we want a unified account of (1b) and (1d). Referential features can be expressed not only on dedicated referential expressions, but also on other sites, such as verbal predicates and attributes that may or may not be fully referential.

Russian predicates display covariation of features with one clause participant, namely the subject. Different patterns may be observed in other languages. For example, Sumbatova and Lander (2014: Chapter 5) discuss gender agreement on predicates in various Dargwa (Nakh-Dagestian) dialects/languages and demonstrate that predicates may contain gender features shared with the intraclausal absolutive, ergative, dative, or even with an argument of an embedded clause. These kinds of facts do not change anything in the explanation of agreement as cognition-to-form mapping: language grammars differ in which referents they require to be reflected in predicates, and such requirements may be organized in a rather complex way. As in Russian, in Dargwa formal controllers may be missing (Sumbatova and Lander 2014: 438), and in such contexts referential features are still expressed on the predicate in the same way. After considering many syntactic interpretations and constraints, the authors ultimately arrive at the conclusion that the most likely controller is “an NP whose referent is the discourse participant that is most important for the speaker” (Sumbatova and Lander 2014: 380). Given that Daghestanian languages generally do not have a grammaticalized syntactic role of subject (A. E. Kibrik 1997), Sumbatova and Lander’s account conforms to the above stated cognitive interpretation, based on the idea of attention focus.

In Dargwa, verbs only have one position to express referential features of a single participant at a time. Of course, there are many languages that express referential features of two or all clause participants (for example, Abkhaz of the Abkhaz-Adyghean language family, see Kibrik 2011: 92), and in such instances the inappropriateness of the form-to-form agreement approach is particularly obvious. There is no space here to review the enormous literature on such languages, alternately characterized with the terms such as polypersonal agreement, pronominal arguments, head-marking, and polysynthesis, so I only mention Mithun (1986) with the apt title “Disagreement” and the recent handbook Fortescue et al. (2017).

Parallel agreement is not only observed in local contexts such as (1b), but it also holds for a whole discourse. Figure 3 depicts mapping unfolding across multiple units of discourse and showing up on various referential expressions and other sites, from nominals to attributive inflections, in (1b–d, m).

As already pointed out above, the shortcomings of the form-to-form understanding of agreement were recognized in various earlier studies, such as Barlow

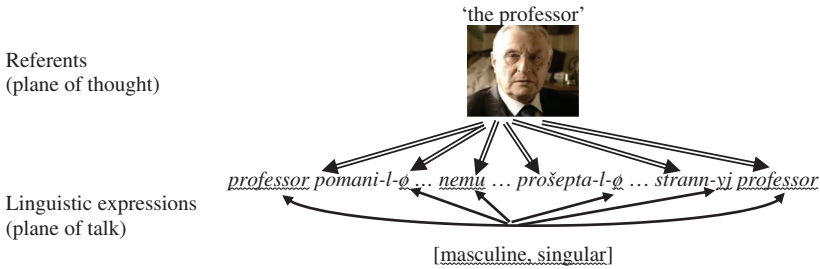


Figure 3: Cognition-to-form mapping of gender and number in (1).

(1988), Pollard and Sag (1994), Biber et al. (1999), Langacker (2008), Croft (2013). Some of the analyses criticizing that approach are grouped with the notion of “feature unification” (see Corbett 2006: 114–116 for a review). Barlow (1988, 1999) provided an important early argument against the traditional approach. He criticized convincingly the idea that the target takes its agreement features from a nominal controller, and that the agreement relationship is fundamentally morphosyntactic:

Morphosyntactic accounts are bound to be inadequate because agreement is highly sensitive to non-syntactic, discourse information, which by its nature cannot easily be anticipated and incorporated into decontextualized agreement rules <...> morphosyntax is simply not the appropriate information structure for agreement relations. The information associated with the morphosyntactic specification of the controller is insufficient to predict the morphosyntactic form of the targets; and consequently morphosyntactic accounts of agreement are bound to be inadequate. (Barlow 1999: 195)

However, Barlow seems to have kept the opposition between controllers and targets (although at the level of discourse), and therefore the idea of form-to-form agreement. In his theoretical framework (so-called discourse linking theory), nominals introduce (or “instigate”) primary discourse referents, while “uttering words containing agreement morphemes causes secondary discourse referents to be added to the discourse, and these secondary discourse referents are linked to the primary discourse referents” (1999: 196). In the framework proposed here, in a discourse context such as shown in Figure 3 there is simply one referent, and its features are mapped onto a variety of sites. There is no need to differentiate between primary and secondary instantiations of the same referent.

A useful unification-oriented analysis was proposed in Langacker (2008):

The kinds of redundancy in question are not handled by “copying” information from one part of an expression to another, but simply as matters of multiple symbolization. That is,

information about some entity is symbolized by more than one component structure within the same symbolic assembly and thus has multiple manifestations in a single complex expression <...> So-called agreeing elements are therefore analyzed as making independent semantic contributions that happen to overlap with information provided elsewhere. Yet this overlap varies in extent, and sometimes the “agreeing” element is the only source of the information in question. (2008: 188–189)

There is an old and still ongoing debate in experimental psycholinguistics, with a larger group of researchers suggesting that features are copied from formal controllers to targets, and a smaller group, more in consonance with what is proposed here, allowing conceptual or notional control over agreement features in linguistic expressions, primarily in attributive phrases (e.g. Vigliocco and Franck 1999); see a detailed review of various psycholinguistic theories in Bock and Middleton (2011), and one of the most recent studies in Brehm and Bock (2017). A useful review of both linguistic and psycholinguistic literature is provided in Acuña-Fariña (2009).

As we see in Corbett’s overview of the debate (2006: 114–116), syntax-oriented unification analyses ultimately seek ways to rescue the form-to-form approach in spite of its frequent failures. In contrast, under the approach proposed here one starts off with the least syntax-bound instances of agreement, appearing on fully-fledged referential devices such as free pronouns. As one moves on to more syntactically bound contexts, such as clauses and noun phrases, the cognition-to-form mapping account nevertheless can still apply. Agreement in tight syntactic contexts can thus be viewed as a special case of the more general phenomenon, that is cognition-to-form mapping. Form-to-form agreement such as in Figures 2 and 3 does take place, but as a side effect of the underlying cognitive process.

In this sense, the proposed approach is converse to Corbett’s (2006: 8–27) “canonical” approach. In that approach, Corbett’s point of departure are those instances of referential feature selection that are most prone to the form-to-form analysis, while various other phenomena (including absent formal controllers, pronominal targets, non-local domains, etc.) are treated as a periphery or extension of agreement. Corbett’s canonical approach helps to keep continuity with the dominant syntax-oriented linguistic tradition, but it is hardly realistic. It is the general and universal situation of recurring reference to an entity in discourse that must be seen as canonical. All languages care about referents, and some languages choose to encode referential features more profusely than others, including on sites distinct from most obvious referential devices. Of course, multiple references to the same entity in discourse lead to shared referential features on various sites, but this is secondary with respect to the general process of cognition-to-form mapping.

6 Instances of clear cognitive control over referential features

In Section 4, I discussed several pieces of evidence from (1) and (3) in which the form-to-form understanding of agreement does not hold. In fact, each of those pieces of evidence exemplifies a massive class of instances that make the traditional linguistic approach highly problematic and lead to a preference for the cognition-to-form mapping approach, if one strives for a consistent treatment of agreement. Those instances are sufficient to contest the traditional approach. However, in this section I supplement a number of additional classes of instances witnessing in favor of the proposed cognition-to-form mapping approach.

6.1 Absence of a formal controller: Exophora

In Section 5 we have discussed anaphoric pronouns, and it was proposed that referential features on such pronouns originate from the cognitive representation of the referent currently activated in the speaker's plane of thought. Syntactic analyses in which referential features are taken from the antecedent may appear acceptable in tighter syntactic domains, and much less so if the antecedent is found in a different sentence or paragraph. But they become outright impossible if one considers so-called exophora (see e.g. Halliday and Hasan 1976: 33; Cornish 1999), in which there is no explicit antecedent at all. Suppose I watch two men, one (with aggressive intentions) approaching the other one from behind. I can comment on this scene by saying *He hasn't seen him*. Clearly, gender and number on these pronouns can only originate from the speaker's cognitive representation. Exophoric pronoun usage abounds in actual language use. An indirect quantitative estimate can be derived from the study Biber et al. (1999: 266), showing that in English conversation situational uses (probably including both exophoric and deictic) of definite NPs account for 55% of all uses, as compared to 25% of anaphoric uses. (The authors particularly mention exophoric uses of third person pronouns, e.g. on p. 331, but do not provide specific counts.)

It is not only free pronouns that can be used exophorically, but also inflections, including attributive ones. Imagine that I am choosing between the cars in a dealer's lot, differing only in color. In that case, I can say in Russian:

- (4) Ja voz'm-u bel-uju
 I take-NPast.1Sg white-f.Sg.Acc
 'I'll take the white one'

The feminine gender on the adjective is due to the fact that the Russian noun *mašina* ‘car’ is feminine. This is *conventional*, as opposed to *notional*, gender⁸ (grammatical vs. conceptual gender in terms of the paper Yudina et al. 2007 discussing Russian agreement). Evidently, inflection is influenced by this fact of Russian, but there is no formal controller. The controller is a mental one. When I, as a user of Russian, prepare to talk about a car, I process the referent as having the feature ‘feminine’. This feature belongs to the lemma associated with the referent in the mental lexicon and it maps onto the adjective as I produce it. This process is depicted in Figure 4 below.

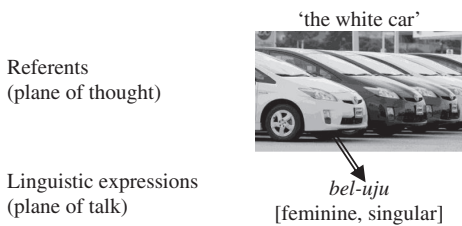


Figure 4: Cognition-to-form mapping of gender and number in (4).

In the classical Levelt’s (1989: 9) model of speaking, there are two cognitive components that successively participate in language production: conceptualizer and formulator.⁹ The conceptualizer is a component responsible for generating a preverbal message, while the formulator “translates a conceptual structure into a linguistic structure” (1989: 11) by accessing lemmas stored in the speaker’s mental lexicon. In schemas such as in Figure 4, the speaker’s “plane of thought” is equal to Levelt’s conceptualizer. But does the conceptualizer “know” all relevant information about referents, such as conventional gender?

Levelt discusses the question of “whether messages must, to some degree, be *tuned* to the target language” and offers the answer that “using a particular language requires the speaker to think of particular conceptual features” (1989: 71). This is what is known as “thinking for speaking” in Slobin’s (1996) work. Levelt further concludes that a speaker

knows by experience whether his language requires a category of medial proximity, number, tense, object shape, or whatever is needed, and he will select the appropriate

⁸ The category of number, typically used in the notional way, can also be sometimes conventional, in particular in pluralia tantum; also see the discussion of deferential plural below in Section 6.7.

⁹ More exactly, the “grammatical encoding” part of the formulator that deals with mental lexicon.

information in building his preverbal messages. It is no longer necessary for the Conceptualizer to ask the Formulator at each occasion what it likes as input. <...> The language-specific requirements on semantic structure have become represented in the Conceptualizer's procedural knowledge base. (1989: 105)

For the purposes of this paper, we can safely assume that even conventional facts, such as the feminine gender of *mašina* in Russian, may be considered as belonging to the plane of thought, or conceptualizer.¹⁰ As Russian speakers talk about cars, they conventionally treat them as sort-of feminine entities, and refer to them with feminine pronouns and inflections, even when there is no nearby noun. In exophoric examples such as (4) there is no possible source of gender marking on the adjective other than the cognitive representation. By the way, there are two other Russian words meaning 'car': *avtomobil* (masculine) and *avto* (neuter). If one of these were preferable to a particular speaker, the corresponding gender would be used on the adjective in (4). This is another confirmation that features stored in lemmas in the mental lexicon affect cognitive processing.

Incidentally, according to some evidence, conventional gender of European languages may have notional overtones. Boroditsky et al. (2003) demonstrate that German and Spanish speakers conceptualize bridges (*die Brücke* – feminine; *el puente* – masculine) and keys (*der Schlüssel* – masculine; *la llave* – feminine) differently: in each case, in accordance with gender assignment, in a more feminine or more masculine way. But no matter whether one accepts this analysis or not, the claim about exophora stands: even purely conventional gender is a part of cognitive representation.

If cognition-to-form mapping of a referential feature can happen in the absence of a formal controller, nothing prevents us from believing that the same thing happens when the noun is present in the linguistic structure, as in *bel-uju mašin-u* (white-f.Sg.Acc car-f.Sg.Acc). The presence of two forms with the same features in the text does not mean that one of them agrees with or is controlled by the other. What actually happens is that both agree with a mental controller, and, as a result, are in parallel agreement with each other.

6.2 Absence of a formal controller: Substantivization

Original adjectives are often used as nouns, bearing a gender/number feature that is attributed on the basis of a noun lemma. For example, in Russian the

¹⁰ Note that in the instances depicted in Figures 1–3, the feature of gender (as well as the feature of number) may be considered either notional or conventional, as these two kinds of information coincide in the case of *professor*.

adjective root *skor-* ‘fast’ has two established substantivized (actually, lexicalized) usages with different gender features (Koval 2006: 301): 1) *skor-yj* (fast-m. Sg.Nom) ‘fast train’, substantivized from the attributive phrase *skoryj poezd* ‘fast train’, where *poezd* is a masculine noun; 2) *skor-aja* (fast-f.Sg.Nom) ‘emergency aid, ambulance’, substantivized from *skoraja pomošč* lit. ‘fast aid’, where *pomošč* is a feminine noun. A Russian speaker can use either a full word combination, or just a substantivized adjective:

- (5) Vyzov-i skor-uju [pomošč’]!
 call-Imp(2Sg) fast-f.Sg.Acc aid(f.Sg.Acc)
 ‘Call for emergency aid!’

The feminine gender on the substantivized adjective helps to ensure that emergency aid is the intended meaning, rather than anything else that can be characterized with the adjective *skor-*. The more genders a language has, the more distinctive is gender characterization. Koval (2006: 301–302) discusses this issue with respect to Pulaar-Fulfulde, an African language with over 20 genders (= noun classes). Table 1 cites three different substantivized adjectives (or participles) bearing the “cow class” (NGE) inflectional endings: ‘dry’, ‘white-bellied’, and ‘newborn’. The adjective ‘newborn’ is also shown in two other gender forms, bearing features of the “bull class” (NDI) and the “human class” (O).¹¹

Table 1: Substantivization of adjectives and participles in Pulaar-Fulfulde.

Substantivized adjectival	Meaning	Class	Full attributive phrase	Gloss
<i>yoor-nge</i>	milkless cow	NGE	<i>nagg-e yoor-nge</i>	cow-NGE dry-NGE
<i>saaj-e</i>	white-bellied cow	NGE	<i>nagg-e saaj-e</i>	cow-NGE white.bellied-NGE
<i>wadd-e</i>	newborn heifer	NGE	<i>nyal-e wadd-e</i>	heifer-NGE newborn-NGE
<i>mbaddi-ri</i>	newborn male calf	NDI	<i>ngaar-i mbaddi-ri</i>	bull-NDI newborn-NDI
<i>badd-o</i>	infant	O	<i>suka badd-o</i>	child.O newborn-O

Clearly, given that referential features help to perform reference so well in the absence of a noun, they are directly mapped onto adjectives from the cognitive structure. If so, nothing prevents us from believing that the same happens in the presence of a noun.

¹¹ Various gender affiliations of this adjective lead to different grades of stem initial consonants: *w-*, *mb-*, *b-*.

6.3 Irrelevance of formal controller

Locutor person forms (that is, first and second person forms, A. E. Kibrik 1997) are apparently chosen not because there is another locutor form somewhere in the linguistic structure, but because speakers directly refer to the mental representation of themselves or of their addressees in accordance with the deictic procedure (Lyons 1975). “The second occurrence of *I* in an expression like *I think that I must go* refers to the same entity independently, rather than agreeing with the first *I*” (Haspelmath 2013: 219). This applies not only to free forms such as *I*, but also to person inflections. In a language like Russian, first person (plural) marking on the verbs in *my uvažаем* ‘we respect’ (1j) and *sami <...> priderživaemsja* ‘we ourselves adhere’ (1k) must be treated in one and the same way, even though (1j) contains a first person plural subject pronoun (and therefore, theoretically, can be treated as form-to-form agreement), while (1k) does not. In both instances, the verb inflection must be seen in a unified way as receiving its referential features directly from the referent through the deictic procedure.

6.4 Lack of feature on the putative formal controller

The putative controller *sami* ‘selves’ (1k) discussed immediately above is underspecified for the relevant feature of person, appearing in the verbal predicate. Much more frequently a similar effect of underspecification, now for gender, is found in Russian locutor personal pronouns. A Russian nonpast tense clause such as *ja vož-u* (1Sg.Nom enter-NPast.1Sg) ‘I enter’ is theoretically compatible with the form-to-form agreement analysis (but see discussion in 6.3). However, a past tense clause such as *ja voš-l-a* (1Sg.Nom enter-Past-f.Sg) ‘I (female) entered’, parallel in its syntactic structure to the nonpast tense clause, readily demonstrates that the verb receives its referential features from the referent, not from a formal controller. The subject pronoun does not carry a gender feature, but the verb is nevertheless inflected for gender. Obviously, a speaker uttering such a clause has knowledge of herself as a female referent, and this feature is directly mapped onto a past tense verb inflection. The grammar of the language dictates that a past tense verb must express a gender feature, and this feature is retrieved from the cognitive structure.

Another example comes from the Russian attributive phrases with the nouns of the so-called “common gender”, such as *sirota* ‘orphan’ or *kollega* ‘colleague’. One can say both *moj blizk-ij kollega* (my.m.Sg.Nom close-m.Sg.Nom colleague.Sg.Nom) ‘my close he-colleague’ and *moja blizk-aja kollega* (my.f.Sg.Nom close-f.Sg.Nom colleague.Sg.Nom) ‘my close she-colleague’. Gender specification comes

directly from a referent's representation as either male or female. Unlike in many other Russian attributive phrases, in such instances the gender feature on the attributes can in no way, even theoretically, be explained by the noun's lexical gender. The form-to-form approach appears fully implausible here.

6.5 “Semantic agreement”

Recall example (1b) and its representation in Figure 2: The Russian noun *professor* ‘professor’, bearing the masculine gender feature, is in parallel agreement with verb inflection. However, the same noun may cooccur with a different feature on the verb, as in the news title in (6), where the verb is marked as feminine, because the referent in question is a woman.

- (6) Rjazansk-ij professor vošč-l-a v Top-100
 Ryazan-m.Sg.Nom professor(m.Sg.Nom) enter-Past-f.Sg in Top-100
 sam-yx citiruem-yx rossijsk-ix filolog-ov
 most-Pl.Gen cited-Pl.Gen Russian-Pl.Gen philologist-Pl.Gen
 ‘A professor from Ryazan was listed among the Top 100 Russian philologists.’
 (From <http://proryazan.com/2015/01/15/56537>, about the Esenin Ryazan State University professor Olga E. Voronova)

The referent's features are mapped onto two different sites: the noun and the verb inflection. (Properties of the third site, the attribute *rjazanskij*, are discussed below in Section 7.) Verb inflection directly represents the notional ‘female’ feature of the referent. As for the noun, in the formal style of Russian, the only available form for a professor of either gender is *professor*, and it is grammatically (conventionally) masculine; see Figure 5.

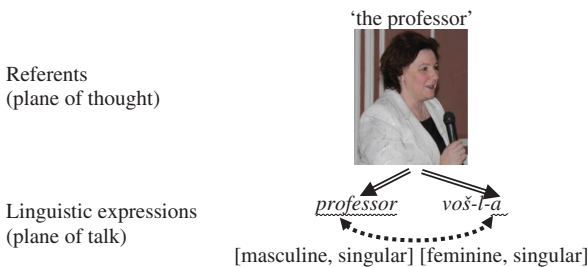


Figure 5: Cognition-to-form mapping of gender and number in (6); subject and predicate.

Apparently, the feminine feature on the verb can only originate from the cognitive structure (double arrow in Figure 5), not from the putative formal controller that bears a different feature. The dotted double-headed arrow in Figure 5 indicates that there is only partial form-to-form agreement between the noun phrase and the verb inflection (in number, but not in gender).

It is quite common across languages with grammatical gender that person naming terms display various kinds of peculiar behavior. In a detailed study of Northern Kurdish, Haig and Öpengin (2015) describe a large array of person naming terms with less than uniform gender affiliation. There can be a complex competition between various factors in the choice of gender marking. As is demonstrated by Braun and Haig (2010), conventional lemma gender competes with notional gender in words such as German *Mädchen* ‘girl’ (neuter): when one speaks about a two-year-old girl they use neuter about 60% of the time, but at the age of eighteen the factor of notional (and biological) gender gains strength, and feminine is used almost 60% of the time.

In Russian, instances such as in (6) are quite common with nouns indicating various social functions that can refer to either men or women but remain grammatically masculine. (In contrast to other similar nouns that come in two versions, e.g. *učitel’* ‘he-teacher’ vs. *učitel’nica* ‘she-teacher’; cf. Proxorova 2012.) Nouns such as *professor* apparently have an intrinsic mismatch between their referential extent and their conventional properties, and that may create difficulties for language users. One regularly produces and encounters expressions such as *avtor pokaza-l-a* (author(m.Sg.Nom) demonstrate-Past-f.Sg) ‘the she-author demonstrated’ or *rukovoditel’ proekt-a predlož-i-l-a* (leader(m.Sg.Nom) project-Sg.Gen suggest-Past-f.Sg) ‘the she-leader of the project suggested’. A speaker of Russian readily feels that the two forms are not in agreement and, consequently, are somewhat awkward, but there is no better option offered by the language.¹² Some speakers may even avoid these kinds of contexts, for example by using the present tense that is not marked for gender. But generally people regularly use feminine inflections in contexts such as (6), which demonstrates that in verb inflection the effect of notional gender is stronger than that of the conventional gender (as well as of the gender of the formal controller).

Corbett (2006: 158) discusses these kinds of instances under the rubric of “semantic agreement”, as opposed to “syntactic agreement”, in which the target matches the formal controller in the feature in question; also cf. index vs.

¹² There are currently efforts undertaken by some feminist activists to overcome this property of the Russian language and to campaign for “feminitives” produced for each occupational term. There is even a feminitive generator at <http://feminism-russia.ru/feminizator>.

concord agreement in Wechsler (2011). (Other terms used to describe semantic agreement include *synesis*, *constructio ad sensum*, and *notional concord*.) The most famous examples of semantic agreement are “committee contexts”, in which a subject such as *committee* cooccurs with a plural-marked predicate: *the committee have decided*, see Corbett (2006: 155–160) for an extensive discussion, and Testelet (2001: 391–392) for analogous Russian examples. In these kinds of instances, the referent, inherently incorporating the idea of numerosity, is treated as plural (Corbett 2006: 165), and this feature is directly mapped onto the predicate inflection. The variation between singular and plural forms of predicates with committee-type subjects points to the fact that a numerous referent can be variously conceptualized as an entity or as a set. In terms of Levelt (1989), the conceptualizer may either be tuned or not to what the formulator suggests. But in any case, the verb picks up its number feature from the cognitive structure.

The situation we encounter in the cases of “semantic agreement” are just as problematic for the form-to-form approach as are the above considered instances of missing or underspecified formal controllers. But these two kinds of instances are problematic in different ways. When a controller is missing or underspecified, there is nothing in the formal structure that could possibly serve as a source of a referential feature on the site of agreement. In contrast, in the instances of “semantic agreement”, a putative formal controller is in place, but it bears a referential feature different from the “target”. In both cases, the source of agreement lies in the cognitive structure. A referent may be equipped with a certain referential feature on the basis of language-independent notional conceptualization, or on the basis of conceptualization tuned to conventional properties of the given language’s mental lexicon, or both.

6.6 Conjunction and disjunction

Quite common are those instances in which conjoined NPs that contain singular nouns are accompanied by a plural predicate (cf. Corbett 2006: 168–170). One such example is found in *udivilis’ i redaktor i poët* ‘both the editor and the poet were surprised’ (1a). Apparently, these kinds of instances can only be explained by the cognition-to-form mapping, as the predicate’s plural feature comes from the conjoined referent’s plurality in the cognitive plane and not from the number feature of any of the involved nouns. Less common but quite interesting are the instances of disjunction. At one moment I caught myself having written a text message to my sister, including the following conditional clause:

- (7) esli ty ili Ida uzna-ete raspisani-e polici-i ...
 if 2Sg.Nom or Ida find.out-NPast.2Pl schedule-n.Sg.Acc police-f.Sg.Gen
 ‘if you or Ida find out the business hours of the police ...’

Semantics of second person plural is often represented with a formula such as 2+3, that is ‘you and non-locutor’, cf. for example Cysouw (2003: 74). In accordance with this semantic formula, in (7) I used the 2Pl inflection on the verb, whose subject was a disjunction involving a 2Sg pronoun and a third person (proper name). There is a special semantic effect here, associated with the fact that only one person will be finding out the business hours, but the predicate is plural. But it seems this is the only option provided by the language in the case of such disjunctive subjects, and this option is clearly grounded in the cognitive representation.

As is pointed out by Testelefs (2001: 376–377), there are also conjunction-related phenomena in Russian noun phrases. First, a shared attribute of two conjoined nouns may be plural: *substantivn-ye padež i čisl-o* (nominal-Pl.Nom case(m.Sg.Nom) number-n.Sg.Nom) ‘nominal case and number’. Second, two conjoined singular attributes may come with a plural head noun: *krasn-yj i zelen-yj fonar-i* (red-m.Sg.Nom and green-m.Sg.Nom lantern-Pl) ‘a red and a green lanterns’. In the latter case, the plural number on the noun is apparently mapped from the plurality of lanterns in the cognitive representation, while the singular on each of the attributes comes from the singularity of individual lanterns of each color. Agreement in conjunction contexts is further discussed in Section 7.

6.7 Deferential plural

It is well known that pronouns and similar forms can carry non-trivial number and person features, see e.g. Mühlhäusler et al. (1990). Attention to these and similar facts was recently attracted with the newly coined term “imposter” (Collins 2014). For example, deferential reference to a single addressee is conventionally performed in Russian with plural second person pronouns *vy* ‘you’, *vaš* ‘your’; the latter possessive pronoun can be seen in (1j). Deferential plural appears not only on pronouns per se, but also on verb inflections, as in (1g) in which the professor is addressed with a plural second person verb form *vidite* ‘you see’. The cognitive mechanism behind deferential plural is reconceptualization of a single individual as something more copious (cf. Keown 2004). At the same time, in certain contexts, e.g. in adjectival predicates, singular inflection is used, as in *vy tak-aja krasiv-aja* (you.Pl.Nom such-f.Sg.Nom beautiful-f.Sg.Nom) ‘you are so beautiful (fem.)’, also see Testelefs (2001: 391). In these latter kinds of instances singular

and feminine on adjectives are again driven by cognitive structure: notional singularity and female gender of the addressee. Different cognitive principles behind selection of referential features on the pronominal subject and the adjectival predicate lead to a mismatch between these constituents. These kinds of instances are discussed at length by Wechsler (2011), in whose theory semantic agreement only takes place when a formal controller lacks the grammatical feature in question. Also, it is worth noting that it is not only number that can be employed as a deferential device. For example, in Polish *pan*, *pani* or Spanish *usted* third person forms (originally, title-based nominal expressions) are used as a deferential substitute of second person reference.

6.8 Attraction

A much-studied phenomenon in the realm of agreement is so-called attraction or proximity agreement, in which the verb predicate demonstrates inflection corresponding not to the subject but to another, linearly closer noun phrase. “In attraction, verbs display sensitivity to the grammatical number of a noun phrase (hereafter, the attractor) that is not the expected controller, but lies in the vicinity of the controller” (Bock and Middleton 2011: 1044). The most famous sentence of this kind is *the key to the cabinets are missing* (Bock and Miller 1991); see Yanovich and Fedorova (2006), Lorimor et al. (2008) and Sekerina (2017) on Russian evidence. Reviews of the large psycholinguistic literature on this phenomenon can be found, for example, in Franck et al. (2002), Eberhard et al. (2005), Bock and Middleton (2011) or Riveiro Outeiral et al. (2012). These reviews involve contrastive accounts of various psycholinguistic theories attempting to explain attraction. There is no room here to go into technical details, but some of these theories explain attraction by semantic interference. In the framework proposed here, it can be said that in the instances of attraction the feature ‘plural’ is activated in the current cognitive representation, and even though it pertains to the wrong referent (it is the key, not the cabinets, that is missing) it gets mapped onto the verb inflection. Gillespie and Pearlmutter (2011) formulate a similar view as follows:

Mismatch effects are the result of the extent to which the head noun and interfering local noun(s) are simultaneously active in memory when the number of the subject NP is being computed. <...> Agreement errors are likely to occur when a number-mismatching local noun is planned within the scope of (i.e. close in time to) the head noun: Because of the overlap in planning, the nouns and their corresponding number elements are likely to be active simultaneously and are likely to interfere at the time when the number marking of the subject NP is set. (2011: 388)

Clearly, attraction phenomena are fully compatible with the cognition-to-form mapping approach. It is interesting to note that Haskell et al. (2010) relate attraction to the general cognitive process of structural priming, that is implicit learning of linguistic choices in language production. In their approach, “the production of agreeing forms is a lexical choice in which alternative agreeing forms (e.g. *eat* versus *eats*) are partially activated and compete for selection” (p. 160).

6.9 Placeholders

In language use, there is a common situation known as tip-of-the-tongue phenomenon, that refers to when a speaker fails to retrieve a lexeme from memory, only having partial access to its mental representation; see Schwartz and Brown (2014). This condition often surfaces as using so-called placeholders (cf. Fox 2010: 6): semantically depleted expressions that urgently take the relevant slot in linguistic structure. One of the typologically common placeholder devices (see Podlesskaya 2010) are demonstratives, and Russian is among the languages that uses them in that function, too. Quite often speakers mark a demonstrative placeholder for number and gender, even though they do not yet have access to the lexeme. For example, Podlesskaya and Kibrik (2009: 186) cite an example, in which the speaker could not retrieve the masculine singular word *binokl* ‘binoculars’ and, while experiencing the tip-of-the-tongue condition, substituted the masculine singular demonstrative *ëtot* ‘this’. These kinds of instances, common in Russian spoken discourse, suggest that referential feature marking comes from the cognitive representation, and these features may be more readily accessible for a referent than the appropriate lexical form. Since there is no formal controller available to the speaker at the time when the demonstrative is uttered, referential features could not be possibly copied from such a controller.

Overall, there are diverse and numerous kinds of instances, some of them highly frequent, that are successfully explained by the cognition-to-form mapping approach. The form-to-form approach is unable to account for these kinds of evidence. It appears that the cognition-to-form mapping approach is much more general and powerful.

7 Partial autonomization of form

In the rather extensive excerpt (1) there is not a single instance of referential features in pronouns or inflections that would contravene the cognition-to-form

mapping approach. However, there exist certain peripheral kinds of instances that appear problematic for this approach, and they must be considered, too.

As discussed above, in example (6) the verb predicate contains the gender feature that is clearly selected on cognitive (more specifically, notional) grounds, and there is a resulting mismatch between the grammatical gender features of the predicate and the subject. At the same time, the inflection of the attributive adjective *rjazanskij* bears the masculine feature, apparently in agreement with the conventional (grammatical) gender of the noun *professor*¹³ that was discussed above; see Figure 6. Notional gender is, however, here ignored.

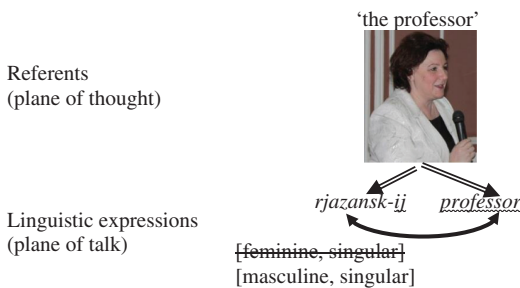


Figure 6: Cognition-to-form mapping of gender and number in (6); the attributive phrase.

In the discussion of exophora in Section 6.1 it was demonstrated that gender marking on an attribute takes place in (4) without any possible syntactic controller. It was argued that such gender marking is driven by cognitive structure, specifically by the way how a concept is represented in the mental lexicon of language users. If one strives for a consistent treatment of agreement across various contexts, one should accept that in (6), where a potential syntactic controller is in place, the masculine gender originates from the properties of the lemma.

At the same time, as we already know, the predicate of (6) is inflected for feminine gender. Apparently, there is a competition between the notional gender and the conventional gender. The former prevails in the case of the predicate, but the latter in the case of the attribute. A possible explanation is that in

¹³ Such inconsistency across tighter and looser agreement contexts is typical of Russian when it comes to occupational terms such as *professor*. When this paper was already finished, I read a short Russian text about a woman (six sentences, 137 words) that contained 4 instances of the feature ‘feminine’ on pronouns and 8 instances of the feature ‘masculine’ on attributes, modifying nouns of the same lexical class as *professor*, that is, masculine-only occupational terms. These feminine and masculine forms alternated in the text. Apparently, each time they were selected in accordance with the requirements of the site of marking.

attributive phrases there is a supplementary factor, and that is form-to-form agreement. The two forms, namely the noun and the attribute, are too close to tolerate a mismatch. This observation may be seen as a manifestation of Corbett's agreement hierarchy (Corbett 1979, 2006: 207) that claims that tighter syntactic contexts, such as attributive phrases, are more likely to follow the principles of syntactic form-to-form agreement than looser contexts, beginning with subject-predicate syntagms and continuing with antecedent-anaphor relations. The contrast between the notionally driven feminine feature on the predicate in (6) and the masculine feature on the attribute, whose explanation involves form-to-form agreement, is reminiscent of Corbett's (2006: 158) remark that one may say *the committee have decided*, but no one says *these committee*.

So, in extra tight syntactic structures, particularly in attributive phrases, a conflict between a notional feature and a conventional feature suggested by a lemma may be resolved in favor of the latter due to the supplementary influence of syntactic agreement. This is the modest place that belongs to form-to-form agreement in language use. Syntactic effects such as in the attributive phrase in (6) constitute an extreme syntacticized periphery of the main regularities observed in agreement phenomena. In standard instances, such as those represented in Figure 3, the surface form-to-form agreement is aligned with the underlying cognition-to-form mapping. But there are less usual instances, as shown in Figures 5 and 6.

In noun phrases such as in (6) the masculine attribute is preferred, and using a feminine on the adjective seems unlikely.¹⁴ However, the situation with the Russian attributive phrases is not straightforward (cf. extensive discussion in Lyutikova 2015). In particular, when the attribute is used restrictively, the situation changes. Suppose there are two female doctors introduced in discourse, one being tall and the other short. (Russian *doktor* 'doctor' is another grammatically masculine noun that may refer to persons of either sex.) If one refers to one of the doctors as in (8), the preferred gender marking on the attribute will be in accordance with the notional feature:

- (8) Voš-l-a vysok-aja doktor
 enter-Past-f.Sg tall-f.Sg.Nom doctor(m.Sg.Nom)
 'The tall she-doctor came in.'

¹⁴ Looking for confirmation of this intuition, I did a Google search of two sequences with lexical content more likely to yield any quantitative results than that of (6). The two sequences, both meaning 'the well-known she-politician declared', are: *izvestn-yj politik zajavi-l-a* (known-m.Sg.Nom politician(m.Sg.Nom) declare-Past-f.Sg) and *izvestn-aja politik zajavi-l-a* (known-f.Sg.Nom politician(m.Sg.Nom) declare-Past-f.Sg). The search provided four and one texts in which these sequences appeared, respectively.

When a possessive pronoun is used as an attribute, the gender feature on the attribute may be either feminine or masculine:

- (9) a. Naš-a doktor přiš-l-a
 our-f.Sg.Nom doctor(m.Sg.Nom) come-Past-f.Sg
 ‘Our she-doctor has come.’
 b. Naš-ø doktor přiš-l-a
 our-m.Sg.Nom doctor(m.Sg.Nom) come-Past-f.Sg
 ‘Our she-doctor has come.’

A Google search for these two clauses provided the numbers of 127 vs. 192, respectively (on two other occasions several months apart, 117 vs. 146 and 94 vs. 134). The difference is not statistically significant, and both variants are comparable in frequency. So, generally, it is not at all the case that in Russian attributive phrases, agreement between a noun and its attribute is always observed. Apparently, a complex network of various principles is at work here, and it requires a detailed discourse-based study.

In association with some Russian nouns, such as *govorjaščij* ‘speaker’ and *adresat* ‘addressee’ in linguistic discourse, the masculine feature, contradicting the female character of the referent, may actually appear not only on attributes, but also on predicates and even on pronouns; these nouns are different from more flexible nouns such as *avtor* or *professor*, discussed above. Given that cognitively driven agreement prevails on predicates and pronouns in other instances, this cannot be explained by form-to-form agreement and must result from a peculiar masculine reconceptualization somehow imposed by such nouns, even when the referent’s notional gender is clearly female (so-called generic masculine, see Hellinger and Bußmann 2014: 9–10). Quite close to this group is the noun *reběnok* ‘child, baby’; cf. example (10) cited from an actual text message about a little girl. This example involves masculine gender marking on two clause predicates that imply ‘the she-baby’ as their subjects, as well as on the intensifier pronoun *sam*.

- (10) a. Reběnok posle sn-a javno lučše –
 child(m.Sg.Nom) after sleep-m.Sg.Gen clearly better
 b. poe-l-ø nakonec normal’no,
 eat-Past-m.Sg finally properly
 c. sam-ø pošë-l-ø obsledova-t’ kuxnj-u
 Int-m.Sg.Nom go-Past-m.Sg explore-Inf kitchen-f.Sg.Acc
 ‘The child is clearly doing better after some sleep – he finally had a proper meal, and went by himself to explore the kitchen.’

Quite likely, in a subsequent sentence, if there were one, the writer could have switched to the feminine. Once again, the gender-related behavior of Russian nouns is complex and there is a large number of noun groups that display somewhat different properties.

Another odd usage of masculine in reference to women is associated with the so-called generalized second person reference. As was pointed out in Section 6.4, Russian locutor pronouns are not marked for gender, and when they serve as subjects, verbal predicates select gender on cognitive bases. But when second person pronouns are used in a generalized way, they demonstrate an inclination to being treated as masculine, even if a female referent is intended. In women's speech, one often hears second person self-reference such as *Esli už ty prišël...* 'Once you have come (masc.) ...', with the masculine verb inflection referring to a woman. The feminine version *Esli už ty prišla...* 'Once you have come (fem.) ...' is also attested. The former type of instances suggests a kind of reconceptualization of female referents into the unmarked masculine gender, taking place in the context of referential generalization. A similar situation is observed in connection with the Russian wh-word/relative pronoun *kto* 'who' that normally requires a gender-marked predicate to be masculine, regardless of the sex of the referent. A Google search for the sequences *kto zaberemene-l-ø* (who.Nom get.pregnant-Past-m.Sg) and *kto zaberemene-l-a* (who.Nom get.pregnant-Past-f.Sg) has yielded numbers 35,400 and 3,460, respectively. Apparently, forced reconceptualization of a female referent into masculine gender has a strong quantitative effect.

As mentioned in Section 6.6, in conjunction contexts, Russian plural agreement marking may follow the principles of cognition-to-form mapping. However, it is not always so, and agreement features (number and gender) may coincide with those of the nearest conjunct, as e.g. in *substantivn-yj padež i čisl-o* (nominal-m.Sg.Nom case(m.Sg.Nom) and number-n.Sg.Nom) 'nominal case and number'. We clearly observe again the supplementary effect of syntactically influenced agreement due to extreme proximity. Such phenomena, both in attribute and in predicate agreement, were explored by Corbett (2006: 169, 179, 220–221, 271–272). Patterns of agreement in conjunction contexts is a domain of high complexity, and numerous factors are involved, including animacy, linear order, style, etc.

In Russian grammar, there is another oft-cited class of complicated instances associated with the selection of referential features. These are found within and in connection with numeral phrases; see Lyutikova (2015) for a useful review and syntactic analysis. In particular, in the phrases such as *dvadcat' odin student* 'twenty-one students' the noun *student* appears in the singular rather than plural. This is apparently due to the fact that the noun

comes right after the numeral *odin* ‘one’, and the singularity of ‘one’ affects the choice of number on the noun. In this case, we see again the effect of extreme proximity. Three interrelated considerations need to be taken into account in any interpretation of such deviant effects. First, numeral phrases are beyond the core of language and constitute a rather specialized and peripheral domain. Second, conscious normativity and codification of language use play an important role in the entrenchment of numeral expressions. Third, the grammar of Russian numeral expressions is unusually complex, involving uncertain part-of-speech affiliation of numerals, inconsistent gender-related properties, special paucal form of nouns with numerals between two to four, different syntactic organization depending on the case and role played in a clause, etc. (see e.g. Belošapkova 2003: 521–527). Thus, idiosyncratic facts such as the singular in ‘twenty-one students’ must be seen as a part of this highly specialized domain, not governed by the standard regularities of language use.

In a language such as Russian that has multiple sites for expressing person, number, and gender, quite a few instances occur, in which no cognitively appropriate specification of a feature is available, but some feature must be selected anyway. In these kinds of instances, defaults are typically used (cf. Testelets 2001: 395; Corbett 2006: 147–151). For Russian, such defaults include third person, singular number, and neuter gender. For example, predicates that do not allow a regular subject in the nominative case, such as *vezti* ‘be lucky’, are used in third person singular in the present (*vezët*) and in neuter singular in the past (*vezlo*). The default approach also applies to some of the instances with numeral phrases, such as *prišlo pjat’ studentov* ‘five students came’, where the predicate is inflected as neuter singular rather than plural. Defaults present a problem both for the cognition-to-form and to the form-to-form treatments of agreement, because the feature’s value does not have any external source. These instances rather demonstrate that the use of person, number, and gender, in such peripheral situations, may be driven not by features of any kind of controller, but by idiosyncratic lexico-grammatical conventions. Note that the default strategy may be quite frequently overridden by cognitive mapping, such as *prišli pjat’ studentov* ‘five students came’ where the verb inflection is plural, while the head of the numeral phrase is still grammatically non-marked for number. The same applies to quantified phrases, such as in (11). The version in (11a) follows cognitive mapping and was actually attested in a message I received, while the more conventional (11b) demonstrates default agreement on the predicate (both the verb and the passive participle); note that the head of the quantified phrase (*boleë*) is not marked for gender and number.

- (11) a. *mog-ut* *by-t'* *predstavlen-y* *bolee odn-ogo*
 may-NPast.3Pl *be-Inf* *represented-Pl.Nom* *more* *one-m.Sg.Gen*
 variant-a
 variant-m.Sg.Gen
- b. *mož-et* *by-t'* *predstavlen-o* *bolee odn-ogo*
 may-NPast.3Sg *be-Inf* *represented-n.Sg.Nom* *more* *one-m.Sg.Gen*
 variant-a
 variant-m.Sg.Gen
 ‘more than one variant may be represented’

In this section, we have reviewed several instances in which the cognition-to-form mapping approach encounters difficulties. These instances can be grouped into three main kinds: extreme proximity between two sites of marking, forced reconceptualization of a female referent into masculine, and default agreement. Note that it is only in the first of these three kinds that we need to resort to form-to-form agreement as a supplementary factor. More generally, all of the considered instances are cases of *partial autonomization* of form taking place in certain specialized contexts. The existence of such partial autonomization should not prevent us from seeing the basic pattern accounting for the majority of the evidence: cognition-to-form mapping leading to parallel agreement between various sites.

8 An assessment of the evidence

As this paper confronts two approaches to agreement, namely the form-to-form approach and the cognition-to-form mapping approach, let me explicitly compare the two against the background of all the evidence provided in the previous sections. Table 2 lists the main types of instances discussed above, with the already familiar examples (mostly Russian) and with an indication of how the cognition-to-form mapping approach and the form-to-form agreement approach fare for each of the types. Types and examples appear in Table 2 more or less in the order in which they were cited above.

This inventory of instances in which certain referential features are selected demonstrates a dramatic preponderance of the cognition-to-form understanding of agreement phenomena. There are seventeen lines in Table 2 with the “Yes No” combination, plus several of the “Yes Yes” kind. In contrast, there are three “No Yes” combinations, all of which are associated with the factor of extreme proximity; in fact, it should be “Not quite” rather than “No” — see Section 7 on how these types of instances can be reconciled with the cognition-to-form mapping

Table 2: Assessment of the main types of evidence.

Type	Example	Cognition-to-form mapping approach works	Form-to-form agreement approach works	Discussed in Section(s)
1. third person pronouns, antecedents within sentence	(1c) <i>oni naklonilis' k nemu</i> 'they bent towards him'	Yes	Yes	4, 5
2. nominal subject plus inflected predicate	(1f) <i>Isus sušestvoval</i> 'Jesus existed' (1b) <i>professor pomani!</i> 'the professor beckoned'	Yes	Yes	4, 5
3. attributive phrase	(1i) <i>vaši bol'sie znanija</i> 'your extensive knowledge'	Yes	Yes	4
4. third person pronoun, no antecedent within sentence	(1n) <i>on</i> 'he'	Yes	No	4, 5
5. inflected predicate with zero subject, antecedent within sentence	(1d) <i>prošeptal</i> 'he whispered'	Yes	Yes?	4, 5
6. predicate with zero subject, no antecedent	(3) <i>slyšal</i> 'he heard'	Yes	No	4
7. (locutor) inflection in predicate, no matching feature on subject; same as type 14 below	(1k) <i>sami</i> <...> <i>priderživaemsja</i> 'we ourselves adhere'	Yes	No	4, 6.4
8. inflection in predicate, no reasonable formal controller	(1g) <i>vidite</i> 'you see' (1e) <i>imejte</i> 'keep'	Yes	No	4
9. third person pronoun, no antecedent at all: exophora	<i>He does not see him</i>	Yes	No	6.1
10. inflection, no formal controller at all: exophora	(4) <i>Ja voz'mu beluju</i> 'I'll take the white one'	Yes	No	6.1

(continued)

Table 2: (continued)

Type	Example	Cognition-to-form mapping approach works	Form-to-form agreement approach works	Discussed in Section(s)
11. inflection, no formal controller at all: substantivization	(5) <i>Vyzovi skoruju</i> 'Call for emergency aid!'	Yes	No	6.2
12. locutor pronouns	<i>I think that I must go</i>	Yes	No	6.3
13. locutor pronominal subject plus inflected predicate	(11) <i>my uvažаем</i> 'we respect'	Yes	Yes	6.3
14. inflection, no formal source of referential feature	<i>ja vošla</i> 'I (female) entered'	Yes	No	6.4
15. inflection in predicate, mismatch with formal controller	<i>moja blizkaja kollega</i> 'my close she-colleague' (6) <i>professor vošla</i> 'a professor got enlisted' <i>avtor pokazala</i> 'the she-author demonstrated' (8) <i>Vošla vysokaja doktor</i> 'The tall she-doctor came in.' (9a) <i>Naša doktor prišla</i> 'Our she-doctor has come' <i>the committee have decided</i>	Yes	No	6.5, 7
16. conjunction	(1a) <i>udivilis' i redaktor i poët</i> 'both the editor and the poet were surprised' <i>substantivnyye padež i čislo</i> 'nominal case and number' <i>krasnyj i zelenyj fonari</i> 'a red and a green lanterns'	Yes	No	6.6
17. deferential plural	(11) <i>vaši</i> 'your' (1g) <i>vidite</i> 'you see'	Yes	No	6.7

(continued)

Table 2: (continued)

Type	Example	Cognition-to-form mapping approach works	Form-to-form agreement approach works	Discussed in Section(s)
18. singular and gender-marked adjectival predicate with deferential plural subject	Vy <i>takaja krasivaja</i> 'you (fem.) are so beautiful'	Yes	No	6.7
19. attraction	<i>the key to the cabinets are missing</i>	Yes	No	6.8
20. placeholders	<i>ětot ... binokl'</i> 'this... binoculars'	Yes	No	6.9
21. inflection on attribute, notional gender is ignored	(6) <i>rjazzanskij professor vošļa</i> 'a professor from Ryazan got enlisted' (9b) <i>Naš doktor prišla</i> 'Our she-doctor has come'	No	Yes	7
22. inflection, reconceptualization of referent	(10c) <i>sam pošěl</i> 'went by oneself'	Yes	Yes	7
23. generalized second person reference, reconceptualization of referent	<i>Esli už ty prišël...</i> 'Once you have come (masc.) ...'	Yes	No	7
24. wh-word/conjunction <i>kto</i> , reconceptualization of referent	<i>kto zaberemel</i> 'who got pregnant'	Yes	No	7
25. conjunction, regard for nearest conjunct	<i>substantivnyj padež i čislo</i> 'nominal case and number'	No	Yes	7
26. number form in numeral phrases	<i>dvadcať odin student</i> 'twenty one students'	No	Yes	7
27. default selection of referential features	<i>vezět</i> 'one is lucky' <i>prišlo pjat' studentov</i> 'five students came' (11b) <i>možet byt' predstavleno bolee odnogo varianta</i> 'more than one variant may be represented'	No	No	7

approach. Also, there is a box with the “Yes?” value, which means that a tentative explanation is available, and the “No No” combination is found in the last line (defaults).¹⁵

As was repeatedly pointed out above, agreement features in the plane of thought may vary in nature. In terms of Levelt (1989), various processes in the conceptualizer may be responsible for selected referential features. In particular, agreement features may be notional, such as ‘current speaker’ in *I*, ‘female’ in *Mom* and ‘single’ in both. On the other hand, they may be conventional, as for example ‘feminine’ in Russian *mašina* ‘car’. As was argued in detail in Section 6, both of these kinds of features belong to cognitive representation. They do not have to contradict each other, but they may do so at times. Table 3 selectively represents some of the types of evidence, analysed above and summarized in Table 2, in terms of possible sources of agreement features on a certain site (target): a notional feature, a conventional feature, or an alleged controller’s feature. The feature of the given site is always indicated as X, and the features of three potential sources are marked as identical (X), optionally identical ([X]), different (Y), or missing (–). Some of the kinds of evidence listed in Table 2 are not included in Table 3, in order to avoid excessive complexity of representation. In situation I, the usual one, everything is matching, except a notional feature may at times be absent (such as notional gender in Russian *mašina* ‘car’). There is a large class II, in which a feature cannot be possibly linked to a formal controller. In contrast, in situation III there is a formal controller, aligned with a referent’s conventional feature, but the referent’s notional feature prevails. In situation IV the supplementary factor of extreme proximity with a formal bearer of the feature cooperates with the conventional feature in overriding a notional feature. In situation V a referent is reconceptualized, which leads to acquiring a conventional feature. Finally, in situation VI agreement feature has no functional source and is simply assigned on a default basis.

The three classical agreement features differ in their (dis)inclination to being notional or conventional (very often both are combined, see Table 3). This varies cross-linguistically (see Siewierska 2004; Corbett 1991, 2000), but typically the picture is as follows. Person is primarily notional, but on rare occasions it may function in a purely conventional way: this concerns, for example, generalized second person reference and deferential Polish and Spanish third person forms

¹⁵ Some interesting aspects have inevitably remained beyond the scope of this paper. In particular, there are certain agreement phenomena in Russian that would be intriguing to explore in relation to my proposal, such as agreement between two adjectivals (Testelelets 2001: 381), agreement of nominal predicates (Testelelets 2001: 382), or agreement in elective constructions (Testelelets 2001: 396–397).

Table 3: Alternative sources of agreement features.

	I.		II.		III.		IV.		V.		VI.	
	Common situation	1-3	No reasonable formal controller with a matching feature	4, 6-11, 14 [X]	Semantic agreement	15, 16, 18	Extreme proximity to the formal source of feature	21, 25, 26	Reconceptualization	23, 24	Default	27
Referent's notional feature	X	[X]	X	X	X	Y	Y	Y	Y	Y	—	—
Referent's conventional feature	X	X	Y	X	Y	X	X	X	X	X	—	—
Alleged formal controller's feature	X	—	Y	—	Y	X	X	—	—	—	—	—
Feature on the site	X	X	X	X	X	X	X	X	X	X	X	X

used for second person reference. Number is usually notional; some exceptions include deferential plurals and pluralia tantum. Gender is often conventional; however, in a language such as Russian, it is largely notional in the case of human referents, highly frequent in discourse. Also, secondary notional effects such as those reported in Boroditsky et al. (2003) must be taken into account.

9 Conclusion

In modern linguistics, “agreement” has developed into an entangled and incoherent notion. Agreement is generally understood in terms of an asymmetric relationship between verbal units, controllers and targets, but proper controllers are missing on a regular basis. The boundaries of agreement are unclear, some researchers treating the uses of the same features as being genuine agreement vs. a different phenomenon (e.g. “congruence”). In spite of the apparent relatedness to the process of discourse reference, agreement is seen as a grammatical phenomenon, and agreement features beyond tight syntactic contexts are considered a periphery. Functions of agreement are not sufficiently understood, in spite of the fact that many languages retain or develop agreement morphology. These and other complications associated with agreement have led some authors to suggest that the notion should be abandoned altogether (Haspelmath 2013: 219–220).

Indeed, the form-to-form view of agreement encounters insurmountable difficulties. There are too many too frequent classes of instances in which this approach simply does not work, such as the lack of any formal controller, the irrelevance of a controller, the lack of a relevant feature on the putative controller, various mismatches, etc. In the sample of Russian discourse analysed, these kinds of factors account for up to one half of all instances. A number of important earlier studies, such as Barlow (1988), Croft (2001), and Langacker (2008), have already indicated the need for radically revising the view of agreement. However, the traditional view remains dominant, in spite of its massive shortcomings. Why is it the case? Probably the main reason is the customary perspective on language as an autonomous system operating with words and governed by formal rules. There remains a strong bias towards syntax-oriented accounts in linguistics and, accordingly, against cognitive and discourse-based explanations. All this leads to highly entangled conceptual systems and interpretations.

Still, if one recasts the notion of agreement, it can remain useful in the vocabulary of basic linguistic theory, and I have attempted to suggest a way how this can be done, relying primarily on the evidence of Russian. Fundamentally,

agreement is the selection of referential features on certain linguistic sites. These sites are, in the first place, referential devices, but other sites that are not obviously referential from the synchronic point of view are possible, too. Referential features are supplied from the cognitive structure, where referents are equipped with such features, either notional or conventional. Selection of referential features is mapping from the cognitive representation to certain sites required by a language's grammar. Some languages are more profuse than others in how many sites they require. When the same features are mapped onto more than one site, we observe parallel agreement between these sites, as e.g. between a subject and a predicate. Parallel agreement emerges as a by-product of mapping from the cognitive representation. In these kinds of instances, both the traditional form-to-form view of agreement and the cognition-to-form mapping approach explain the facts well. However, there are numerous and heterogeneous classes of instances, many of them frequent, in which the form-to-form approach fails and, consequently, cognition-to-form mapping remains the only available explanatory principle. In a limited number of specialized instances, particularly associated with extreme proximity of agreement sites, we observe tight syntactic contexts in which form-to-form agreement needs to be drafted in as a supplementary factor in an explanatory model. These kinds of specialized instances should not prevent us from seeing the basic pattern. If we adopt the cognition-to-form mapping approach, problems only arise in several restricted classes of instances. In contrast, if we keep to the form-to-form approach, we stumble literally at every other step.

The cognition-to-form mapping approach puts agreement in the ecological context of language use, connecting it with the phenomenon of discourse reference and, more generally, with the cognitive processes that govern language production. The cognition-to-form mapping approach is in line with the view that language is a functional system serving human needs.

What could be envisioned extensions of the proposed approach? A large range of relevant phenomena would present themselves if linguistic diversity is fully taken into account. Apart from person, number, and gender, there are other putative agreement features, such as definiteness and even tense (see Corbett 2006: 133–140). There are languages with a larger range of agreement sites than Russian, for example some Daghestanian languages (A. E. Kibrik 1994), and there are particularly exotic sites of agreement marking, such as the Tsakhur particle 'and, also' (Testeleets 2001: 380–381). Languages may differ in the extent to which they are prone to this or that analysis of agreement, and that is an empirical question. I expect that the proposed cognition-to-form mapping approach, simple and clear in its logic, will be shown to apply to a variety of languages. My prediction is that in certain languages any kind of

form-to-form agreement may turn out entirely irrelevant, and those should be languages with a lesser tradition of conscious normativity, codification, and written language use.

I have only cursorily mentioned diachronic considerations in this paper. There are strong forces that lead to the spread of referential features at certain stages of the history of languages and to their decay at other stages. For example, as is clear from the detailed account in Konošenko (2015), the history of Mande languages (West Africa) is the history of the emerging and expanding inflection for referential features. In contrast, the history of some Indo-European languages during the last couple of millennia is the history of such features gradually eroding. In the case of Daghestanian, described in Sumbatova and Lander (2014), gender features underwent decay in certain languages, whereas person features are on the rise and appeared independently in a number of languages from different groups. Clearly, the cognition-to-form mapping approach must be coupled with the diachronic dimension, in order to gain a truly realistic general picture. See Fleischer et al. (2015) for a recent collection of papers on the diachrony of agreement.

Our understanding of the functions of agreement is notoriously meager, and we may be able to address this question on the basis of a theoretically realistic and empirically grounded approach. A functionally plausible model of agreement may open up new directions for psycholinguistic and neurolinguistic studies of agreement processing. I would like to conclude with a quote from Acuña-Fariña (2009: 419) suggesting how these two routes of potential development can actually combine:

Agreement is extremely functional in that it offers a wide menu of deletion of core elements. This is a precious commodity in a world where the choice between radically different interpretations hinges on analyses conducted in well under half a second.

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