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Research Article

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Humans, Animals, Things and Animacy

Abstract: Animacy influences the patterns of subject-verb agreement marking in many languages, including Persian and Inari Saami. In Persian, animate plural subjects trigger plural agreement on the verb, whereas inanimate subjects may or may not trigger agreement. The variation is governed by factors such as personification, agency and distributivity. In Inari Saami, verbs fully agree with human subjects and verbs partially agree with inanimate subjects. Verbs may or may not agree with subjects referring to animals.

We argue that the intricate interaction between biological animacy and grammatical agreement in these two languages warrants careful consideration of the tripartite distinction between biological animacy in the world, our conceptualization of animacy and formal animacy features in the grammar.

Keywords: agreement; animacy; features

1 Grammaticalized animacy

This paper considers the role of animacy in the subject-verb agreement systems in Persian and Inari Saami. The two systems are modelled with a limited number of features, including an animacy feature. We argue that an account of animacy in grammatical systems demands careful consideration of the tripartite distinction between grammatical animacy, our cognitive construal of animacy, and animacy 'in the world' (i.e., biological animacy and associated properties).

Human language is sensitive to the animacy of the entities it describes. For example, sentences where the subject is animate and the object inanimate are more common than sentences where the subject is inanimate and the object animate (Comrie, 1981). Is this because of how human language works, or is it simply because humans and other animals are more likely to act on inanimate things than vice versa? Our guess is that some animacy effects have very little to do with language and grammar; the effects simply follow from what events take place in the world and how humans view and process those events. Other animacy effects seem to form a solid part of the grammatical systems of some languages. We will discuss examples from Persian and Inari Saami in this paper to illustrate the latter point.

If we take the view that animacy factors are either part of the outside world or part of the linguistic system proper, some puzzles arise. One puzzle concerns the mirroring of non-linguistic and linguistic animacy in the so-called *animacy hierarchy* (Silverstein, 1976, 122). The animacy hierarchy is illustrated in (1):

(1)   1st/2nd person > 3rd person pronoun > proper name > human noun > non-human animate noun > inanimate noun

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This hierarchy seems to be based on notions of agency and closeness to the speaker/hearer.[1] These are extra-linguistic notions, yet many grammatical phenomena across languages are sensitive to the hierarchy. For example, entities higher up (further left) in the hierarchy are more likely to trigger agreement on the verb (e.g., Comrie 1981), as will be illustrated below.

Reference to the animacy hierarchy has been claimed to be linguistically universal, but not all languages with grammatical animacy are sensitive to all the distinctions on the hierarchy. Instead, it is an implicational hierarchy: for example, if a human non-pronominal noun triggers agreement, proper names and pronouns will, too. We mentioned that the hierarchy in (1) seems to rely on extra-linguistic notions: the hierarchy is naturally explained in terms of what the linguistic expressions refer to in the world. The ranking reflects 'closeness' of referents to the speaker and hearer; closeness in terms of relevance, interaction, and perhaps empathy (Yamamoto, 1999). It starts with the types of entities that are closest to a given individual's point of view (the speaker and the hearer) and descends along a scale of agency and closeness to the speaker or hearer. After the speaker and hearer is a third person who is relevant and discourse-familiar enough to be referred to with a pronoun. After that comes an individual who is relevant or important enough to be known by a proper name. Then the rest of the hierarchy is organized according to how relevant they are to the speaker/hearer and how likely they are to take part in interactions. The hierarchy continues with other humans, followed by animals, and finally, lowest on the hierarchy, are inanimate things. Why should the way grammar is organized reflect the way the world is organized (in terms of interactions with and relevance to the speaker and the hearer) if the two are independent? We could try to argue that the two (the grammar and the world) are intrinsically connected and that grammatical animacy directly reflects biological animacy. This approach does not seem promising since it would predict much less cross-linguistic variation than we actually find. We instead adopt a formalist perspective on language, according to which grammars can in principle be analyzed and understood independently of the external environment that the speakers inhabit. However, we also assume that the way in which humans conceptualize the world around them can influence how language changes (perhaps as a result of reanalysis in acquisition) and to some extent also how formal linguistic tools are put to use. Certain phrases are more likely to be uttered and juxtaposed, and certain patterns are therefore more likely to be grammaticalized than others. We do not propose that all linguistic patterns can be explained with reference to how humans interact with the world, but perhaps the universality of the animacy hierarchy can.

Let us now turn to a different point: what is a categorical rule in one language can materialize as a statistical (non-categorical) tendency in another language. In order to illustrate this, we return to the generalization about animacy and subjecthood briefly mentioned above: cross-linguistically, subjects tend to be animate and objects inanimate. Jakaltek and Halkomelem categorically disallow inanimate subjects in transitive clauses (Aissen, 2003), and Swedish statistically disfavors them (Dahl, 2008). In other words, the categorical rule in Jakaltek and Halkomelem is echoed by a non-categorical tendency in Swedish. Like Swedish, English in principle allows inanimate subjects. However, English passives are disproportionately common when they serve to promote animates to subject position (Clark, 1965; Harris, 1978), perhaps because animates are more conceptually accessible (Bock and Warren, 1985), or because of interactions with typical thematic role assignments (Ferreira, 1994). Whatever the explanation may be, animate subjects are cross-linguistically preferred over inanimate subjects, but this preference is a grammatical requirement in only a minority of languages.

Bresnan et al. (2001) discuss a similar case that concerns the person hierarchy. In the Salish language Lummi, the person of the subject cannot be lower on the person hierarchy than the person of the object (first and second are ranked over third person, cf. (1)). For example, a sentence with a third person subject and a first person object is not allowed. In order to avoid such a constellation, Lummi employs the passive (Jelinek and Demers, 1983). This constraint is easily violated in English: *John saw me* is perfectly natural. However, Bresnan et al. (2001) present evidence from corpus data that the pattern that is categorically avoided in Lummi is also avoided to a certain extent in English: the dispreferred pattern is avoided by strategic use of active and passive sentence structures. Even though the constraint is not categorical in English, the preference for

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[1] The scale has been argued to combine and conflate several different dimensions: definiteness, the person hierarchy, and animacy proper (Zaenen et al., 2004; Siewierska, 2004; Croft, 1990).

a sentence structure that respects the person hierarchy reaches statistical significance. Bresnan et al. (2001) argue that the grammatical pattern in Lummi is a result of a hard constraint whereas the English grammatical pattern is a reflex of a *soft* constraint in the grammar. The more general point of their paper is that statistical tendencies should be captured by soft constraints, and these soft constraints are part of the grammatical system.

The approach advocated here does not adopt soft constraints in the grammar. We assume instead that statistical tendencies such as the ones that can be found in the English active/passive alternation are explained by how humans conceptualize the world.[2] It is not surprising that such tendencies align nicely with actual grammatical constraints in other languages: patterns in language use can be incorporated into grammars through mechanisms of acquisition and change. Our background assumptions as we set out to explore animacy in language thus crucially rely on the idea that only some of the relevant observations are due to grammar proper. The ideas pursued here relate directly to the on-going debate about whether animacy is reflected in narrow syntax (Ritter, 2014) or only part of our "encyclopedic" knowledge (Ramchand, 2008; Folli and Harley, 2008). We will argue that it is important to keep in mind that animacy can be defined at three distinct levels: biological animacy, animacy in the human conceptual system (which is the locus of encyclopedic knowledge), and animacy as a feature in human grammars, including narrow syntax.[3] We comment on these three levels below.

1. *Actual animacy*. Biological animacy is defined in terms of whether an entity is a alive ("animate") or not alive ("inanimate") (see, e.g., Kittilä et al. 2011; McLaughlin 2014). There are a number of important differences between the two categories. For example, non-living entities cannot self-propel, act voluntarily and feel, but living entities can. However, not all living beings are equally likely to do these things. For example, plants and cells are living entities, but they do not act voluntarily, nor do they feel. The biological distinction between animates and inanimates is a simple binary distinction, but there are also other real distinctions that are relevant for conceptual animacy and, indirectly, grammatical animacy. Furthermore, folk definitions of animacy tend to make reference to motion and volition.

2. *Our construal of animacy*. Our conception of animacy in many cases aligns well with biological animacy: we treat (and talk about) the rocks in the pavement as inanimate but our neighbors as animate. However, our conception does not always directly match biology. Personification is a clear example of a mismatch. People interact with inanimate entities such as computers and cars. We sometimes feel and behave as if these entities have feelings and intentions, even though we know they do not. There are also mismatches that are less straightforward than personification. de Hoop and de Swart (2018) argue that conceptual animacy is *gradient*, which indicates that entities can be conceptualized as more or less animate. We think this is correct: dogs are conceptualized as more animate than insects, and insects as more animate than cells and plants. What are the factors that influence whether we (typically unconsciously) conceptualize entities as animate? A number of studies indicate that the ability to self-propel and move in certain ways is important (Gelman et al. 1995; Tremoulet and Feldman 2000, and others). Frawley (1992) ties animacy to the "relative influence and potency" in events, and Folli and Harley (2008, 191) similarly mention *teleological capabilities*: "the inherent qualities and abilities of the entity to participate in the eventuality denoted by the predicate". Dahl (2008, 145) suggests that "the capacity for perceiving and acting upon the environment" is the defining criterion for animacy. It is evident that human languages and grammars reflect some notion that can be roughly characterized as animacy, but it seems equally evident that "animacy" is not a simple concept. Instead, animacy is a collection of characteristics that are all in some way associated with what living creatures are capable of. Careful reviews of factors that seem to be related to the notion of animacy (and therefore potentially reflected in linguistic systems) can be found in Frawley (1992, section 2.23) and Becker (2014, chapter 3.1.2). In sum, different factors play a role in whether an entity is perceived as animate, and those factors may interact.

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2 Another example is provided by Snider and Zaenen (2006), who find that inanimates are more frequently topicalized than animates in English.

3 Previous authors who have stressed the distinction between grammatical animacy and grammar-external animacy include Frawley (1992); Ormazabal and Romero (2007); McLaughlin (2014); de Hoop and de Swart (2018).

3. *Formal animacy features in the grammar.* Animacy can become integrated into the linguistic system, for example as agreement or case morphology. When this happens, the distinction is part of a formal system that only has access to the entities and activities in the world that it describes through the human construal of "what is out there". As far as the grammar is concerned, animacy has no direct meaning, it is simply a technical feature with direct and observable effects on the formal output of the grammar. Because animacy is a complex notion, languages can differ in how (and whether) they have grammaticalized this notion. For example, animals might pattern with humans or with inanimates. Nevertheless, once a language has adopted animacy into the grammar, it is part of the formal, mechanical system of that language.

Statistical ("soft") effects of animacy in a language emerge when animacy has not been grammaticalized in that language. It is not part of the formal linguistic system. In languages where animacy has been grammaticalized, the animacy features constrain the linguistic output systematically and predictably. However, there is still some room for variability, because the context as well as individual speakers' conceptualization of animacy can differ (point 2 above). This is what makes personification possible, for example.

The Persian and Inari Saami data presented below include mismatches between grammatical and biological animacy, and such mismatches are not surprising, given the tripartite distinction between grammatical, conceptual, and biological animacy. Such mismatches are also familiar from other linguistic categories: grammatical gender connects to biological sex only very loosely, if at all; linguistic tense does not line up with time perfectly; locative prepositions and case markers extend beyond concrete spatial relations; grammatical specifications of perfectivity and telicity do not always correspond exactly to completed action; and so on. Linguists choose labels for grammatical features according to intuitions about how linguistic categories relate to categories in the world. However, the mapping between language and the world is not direct.

2 Persian

2.1 Animacy in Persian

Animacy is an active grammatical feature in Persian (Farsi). The animacy distinction does not follow the strictly biological living/non-living distinction, since plants pattern with inanimates. We assume that this is because of how plants are conceptualized in Persian (and, indeed, in many other languages): they are low enough on the animacy scale to be grouped with inanimates.

The animacy feature is evident in the marking of number on nouns. Persian has two nominal plural markers *-ha* (pronounced *-a* after consonants) and *-an*. The marker *-ha* is general and can be used for any noun, but *-an* is described as being restricted to animates (Ghomeshi, 2003; Lotfi, 2006). The *-an* marker is also restricted to more formal registers and is no longer commonly used in modern Persian. The following table is adapted from Lotfi (2006, 124):[4]

(2)

	ANIMATES	INANIMATES
-HA	*mard-ha* 'men', *zan-ha* 'women' *shir-ha* 'lions', *deraxt-ha* 'trees'	*dard-ha* 'pains', *tan-ha* 'bodies', *tir-ha* 'arrows', *raxt-ha* 'garments'
-AN	*mard-an, zan-an, shir-an, deraxt-an*	**dard-an, *tan-an, *tir-an, *raxt-an*

The general rule is that only animates can take the *-an* plural. However, there are exceptions to the general rule, as illustrated by *deraxt-an* 'trees'[5] in (2), and also *sokhan-an* 'words' and *shab-an* 'nights' . Once a feature is grammaticalized, such exceptions are common. We propose that the *-an* ending is grammatically specified

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4 Note that the Persian data presented in this paper are taken from a number of sources and the authors use slightly different transliteration conventions.

5 Plants do not in general take *-an*. For example, *gol* 'flower' and *booteh* 'bush' are compatible only with the plural ending *-ha*.

as animate, and this specification prevents *-an* from combining with stems that are specified as inanimate. We further propose that nouns typically gain their animacy feature according to how the speakers conceive of the entity in the world that the noun refer to. This is conventionalized knowledge, similar across speakers, but not strictly part of the grammar. It can be compared to how the animacy of entities lead English speakers to choose *she/he* or *it*. Although most nouns are not inherently (grammatically) specified for animacy, a few nouns are. The grammatical specification then overrides the conceptual specification. The word *deraxt, sokhan* and *shab* are optionally specified as animate grammatically, and this grammatical specification allows them to combine with *-an*.

The plural marker *-an* is not our main focus here, but serves to illustrate the point that animacy can be a grammaticalized feature. We now turn to the singular-plural distinction in the verbal agreement system of Persian, which is crucially affected by the animacy of the subject. Persian verbs agree in person and number, as illustrated in the present tense paradigm for 'to go' in (3), where *mi-* is the present tense marker:

(3)   *'to go', present tense*

	SINGULAR	PLURAL
1	miravam	miravim
2	miravi	miravid
3	miravad	miravand

Persian is a pro-drop language: pronominal subjects can be omitted, in which case information about the person and number of the subject comes exclusively from the agreement endings on the verbs. We will only be concerned here with third person subjects.

Standard Persian allows agreement in number with *animate* plural subjects but not with *inanimate* plural subjects, as illustrated in examples (4)–(5) from Lotfi (2006, 126):[6]

(4)   marda umad-an   xune.
        men   come-PAST.PL home
        "The men came home."

(5)   ketaba bad forush raft.
        books bad sale   go.PAST.SG
        "The books sold badly."

The subject *marda* 'men' in (4) is animate and the verb is inflected for plural number. By contrast, the inanimate plural subject *ketaba* 'books' in (5) does not trigger plural agreement on the verb.

Several grammar books point out that the generalization that inanimate subjects do not trigger plural agreement is not absolute (Rosen 1898, 65; Mahootian 1997, 65), and a few recent studies specifically address the point that inanimate subjects *optionally* agree with the verb (Lotfi, 2006; Sedighi, 2006; Hashabeiky, 2007; Feizmohammadpour, 2013). Examples (6)–(7), from Sedighi (2006), are both grammatical in Modern Persian, and they illustrate the optional agreement:

(6)   toofan-ha-ye peyapey dehkæde ra viran   kærd.
        storm-PL-of constant village   ACC destroyed did.3SG
        "Constant storms destroyed the village."

(7)   toofan-ha-ye peyapey dehkæde ra viran   kærd-ænd.
        storm-PL-of constant village   ACC destroyed did-3PL
        "Constant storms destroyed the village."

6 The following abbreviations are used in this paper: ACC accusative, DU dual, EZ ezafe, LOC locative, NOM nominative, PL plural, SG singular.

Inanimate plural subjects thus seem to be compatible with both singular and plural verbs. However, this optionality is not a case of free variation. Several authors (e.g., Hashabeiky 2007) have suggested that factors such as agency and distributivity govern the distribution of the plural verb morphology. In what follows, we explore the constraints on verbal agreement in Persian. Our proposal draws upon the interplay between the grammar, our construal of the world, and the world itself. The grammar does not have direct access to biological animacy. The grammar has to connect with the world through its human host and that human's conceptualization of the world. Four notions that seem to be relevant will be discussed below: personification, agency, distributivity, and existentiality. Before we turn to these four topics, we sketch our formal assumptions.

2.2 Basic analysis of Persian agreement

We will assume a basic featural analysis of verbal agreement. We do not cast our analysis in any particular theoretical framework, as we hope it is compatible with a variety of frameworks. However, the details of our proposal are straightforwardly implemented in Lexical Functional Grammar (Kaplan and Bresnan, 1982; Dalrymple, 2001; Bresnan et al., 2016).

We express grammatical information as valued features; for example, a lexical item specified as animate would have the feature [ANIMATE +], and a lexical item specified as inanimate would have the feature [ANIMATE −]. We further assume that certain morphemes or words must 'match', that is, be compatible with each other. This is the case for subject-verb agreement, but also for the agreement in animacy between nouns and plural morphemes that we discussed above in section 2.1. Morphemes can (but do not have to) add to the features of the element they combine with, but they cannot change the features.

As mentioned above, we propose that Persian nouns are not *inherently* specified as animate or inanimate, they receive a specification according to how the speaker conceptualizes the entity denoted by the noun. The animacy specification on nouns typically matches speakers' conceptualization of the entity denoted by the noun. Although the animacy specification often matches biological animacy, this is not always the case, as we will see. Other lexical items that interact with nouns are inherently specified according to grammar-internal criteria and do not rely on the speaker's conceptualization of the world. We will briefly discuss plural morphemes and then turn to verbal agreement markers.

The information from the plural marker and the uninflected noun combine to provide the full feature bundle of the inflected noun. The features cannot be in conflict, nor can the features of one morpheme delete or change the features of the other morpheme. The features from the noun and the plural marker (or the verb and the agreement marker) thus combine monotonically. The noun *mard* 'man' is specified as [ANIMATE +], and the noun *dard* 'pain' is specified as [ANIMATE −]. The ending *-an* is specified as [ANIMATE +], and the ending *-ha* does not have an animacy feature. It then follows that *-ha* can combine with animates or inanimates and the inflected noun gets its animacy value from the noun alone. The ending *-an* can only combine with animates, otherwise the features would conflict. A few words are pre-specified in the lexicon as optionally [ANIMATE +], even though the words denote biologically inanimate entities. The [ANIMATE +] feature is a purely formal feature that is only indirectly related to animacy. It is therefore possible for a few nouns that denote entities that are conceptually and biologically inanimate to be specified as [ANIMATE +] and take the *-an* ending.

We now turn to the verbal agreement marking, beginning with an outline of the basic feature specifications on verbs and nouns in Persian. This subsection accounts for the language as it is described in traditional grammar books: verbs agree with animate subjects in number, but inanimate subjects take singular (default) agreement. It is not immediately obvious how this characterization of Persian agreement covers examples where nouns that refer to inanimate objects trigger plural agreement marking on the verb (see, e.g., (7)). Subsections 2.3–2.6 deal with instances that diverge from the traditional generalizations.

In our analysis, what is called the third person singular form is actually a kind of default. It is only specified for its person feature: it is specified for third person and cannot take a first or second person subject. It is unspecified for number and animacy, but those features can be contributed by the subject. The plural

agreement marker, on the other hand, is specified for person, number and animacy. We provide the subject agreement parts of the verbal lexical entries in (8)–(9):

(8) Agreement marking on third person singular verbs (e.g., *miravad* in (3))

$$\left[\begin{array}{ll} \text{PERSON} & 3 \end{array} \right]$$

(9) Agreement marking on third person plural verbs (e.g., *miravand* in (3))

$$\left[\begin{array}{ll} \text{PERSON} & 3 \\ \text{NUMBER} & \text{PLURAL} \\ \text{ANIMATE} & + \end{array} \right]$$

The plural marker *ha* is grammatically specified as (10), and the plural marker *an* is specified as (11):

(10) Plural affix *-ha*

$$\left[\begin{array}{ll} \text{PERSON} & 3 \\ \text{NUMBER} & \text{PLURAL} \\ \text{ANIMATE} & - \end{array} \right]$$

(11) Plural affix *-an*

$$\left[\begin{array}{ll} \text{PERSON} & 3 \\ \text{NUMBER} & \text{PLURAL} \\ \text{ANIMATE} & + \end{array} \right]$$

Nouns typically lack an inherent grammatical animacy specification: they receive an animacy specification according to how the speaker construes the referent. According to this proposal, our conceptualization of the world can inform the grammar, and formal features can get filled in accordingly.

There is no specification for number or animacy in (8), so the third person "singular" verbs are compatible with animate and inanimate singular subjects, as well as inanimate plural nouns. Verbs with plural agreement are specified as animate. However, this proposal would predict that third person singular verbs are also compatible with animate plural subjects, which they are not. We propose that this follows from the *Elsewhere Principle* (morphological blocking; Kiparsky 1973; Anderson 1992, and others): when two forms are in principle grammatical, the more specific form is chosen over the more general form. The feature bundle in (9) is more specific than (8). The plural morpheme *-and* that is associated with the specifications in (9) must therefore be chosen when possible.

2.3 Personification

In example (12), the subject *setareh-ha* triggers plural agreement on the verb, even though stars are biologically inanimate:

(12) setareh-ha cheshmak mizanand.
      star-PL   wink   hit.3PL
      'Stars wink.'

The verb *wink* normally takes an animate subject, and in this sentence, the subject is perceived to be animate: animacy is projected onto *setareh-ha*. This is an example of *personification*: an inanimate entity is portrayed in speech or in writing as if it were animate. Personification is a cross-linguistically frequent way to elevate inanimate entities to animate status in speech or writing. Animals can also be personified and portrayed as if they were human.

In this instance, the noun is conceptualized as animate, even though the actual status of the referent is inanimate. Because of the way the speaker/writer perceives of the noun in the context, the noun is assigned the grammatical feature [ANIMATE +]. It then follows that *setareh-ha* takes plural agreement.

This approach relies on underspecification: nouns (with some exceptions) are underspecified for animacy and the feature gets filled in by context and speaker preference. A computationally more costly approach would be to employ defaults, such that some nouns are specified [ANIMATE +] by default and others [ANIMATE −] by default. The default applies unless it is overridden by, for example, personification. Default overrides could be an alternative way to formalize de Hoop and de Swart's (2018) proposal that atypical animacy patterns in language be analyzed as semantic type shifting.[7] We leave these questions for future research and will continue to assume the simpler underspecification approach here.

2.4 Agency

Feizmohammadpour (2013) shows in a series of psycholinguistic experiments that speakers prefer plural over singular agreement on verbs of agency, even when the subject is inanimate plural. She provides the following example (Feizmohammadpour, 2013, 100):

(13) ætr-ha   gerye mikon-æn
      perfume-PL cry   do-3PL
      'The perfumes cry.'

The subject 'perfumes' is inanimate, yet the participants in her experiment preferred the plural agreement on the verb. Feizmohammadpour argues that verbs with high agency (she includes *cry, dance, walk, wink*) not only allow personification, but force it, as inanimates lack agency. In other words, whatever (strange) interpretation a speaker finds for a noun-verb combination such as *perfumes* and *cry*, the interpretation necessarily involves imposing animacy on *perfumes*: the verb demands it. We therefore treat biologically inanimate subjects in combination with verbs of high agency as a special case of personification (section 2.3). In other words, when an inanimate noun is combined with a verb with high agency, the referent of the noun is conceptualized as an entity that is compatible with agency; that is, an animate entity. The noun receives an [ANIMATE +] feature in this context, and is compatible with the plural ending on the verb.

2.5 Existentiality

There is a cross-linguistic pattern that allows singular agreement with plural subjects in existential sentences. For example, many speakers of English find *?there's lots of boxes in the attic* acceptable, even though they would not accept **lots of boxes is in the attic* (see, e.g., Melnick 1994 and references cited therein).

This pattern holds in Persian as well: SINGULAR agreement is possible for both animate and inanimate plural subjects in existential sentences (Ghomeshi, 2008):

(14) dar in bagh   xargoosh-haye ziadi ast
      in this garden rabbit-PL.EZ   many is.3SG
      'There are a lot of rabbits in this garden.'

(15) tooye otagh faghat 3 ta   bacheh bood
      in.EZ room just   3 CLASSIFIER kid   was.3SG
      'There were just three kids in the room.'

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7 de Hoop and de Swart (2018) distinguish between overt and covert type shifting, where overt shifting does not alter the conceptual animacy of the noun phrase but covert shifting does. With defaults, overt shifting could be analyzed as a grammar-internal interaction between lexical items that does not involve default overrides, while covert shifting occurs when animacy defaults are overridden.

Plural agreement is also possible in (14)–(15), but the examples are then not interpreted existentially, but as a regular predicative clause: 'A lot of rabbits are in this garden' (see McNally 2011 for a thorough discussion of existentials).

We view this as the opposite of personification. Recall that Feizmohammadpour (2013) argues that using inanimates as subjects of high-agency verbs forces personification, which on our analysis means conceptualizing the referent of the noun as animate and assigning an [ANIMATE +] feature to the subject noun. We hypothesize that an existential reading can strip the subject of its agency. The subject merely exists, and does not have an agentive role in the sentence. Since a lack of agency correlates with inanimacy, the non-agentive subject is conceptualized as inanimate and assigned the feature [ANIMATE −]. This explains why plural animate subjects can take singular agreement in existential sentences in Persian.

2.6 Distributivity

Lotfi (2006) and Hashabeiky (2007) argue that plural agreement marking on the verb can signal distributivity. Feizmohammadpour (2013) further provides psycholinguistic evidence for this claim. We include this short section on distributivity here for completeness, even though it is not completely clear how it connects to animacy. However, it has often been noted that individuation is connected to animacy (Yamamoto, 1999), and that animates are associated with count nouns and inanimates with mass nouns (Dahl, 2008). As Yamamoto (1999: 4) puts it: "'Individuation' and 'animacy' are two separate notions which closely interact with each other".

According to Lotfi (2006), plural marking on the verb in conjunction with a plural inanimate subject signals that the entities referred to by the subject are "individuated in action". Singular marking signals that the entities are "collectivized in action". Consider the following examples from Lotfi (2006):

(16)   sosis-a   suxt
       sausage-PL burnt.3SG
       'The sausages burnt.'

(17)   sosis-a   suxt-an
       sausage-PL burnt.3PL
       'The sausages burnt.'

The judgements are subtle, but Lotfi (2006) argues that the difference between (16) and (17) is that (17) is interpreted distributively and (16) is interpreted collectively. Lotfi's proposal is supported by Hashabeiky (2007) and also by Feizmohammadpour's (2013) psycholinguistic study.

There is no reason to believe that the subject in these examples is interpreted as animate, so the analysis we presented above (sections 2.3. and 2.4) for cases of personification cannot be extended to explain the plural agreement in (17) (or (7) above). We therefore posit a separate lexical entry for the plural agreement marker that is specified for distributivity but not for animacy:

(18)   Agreement marking on distributive third person plural verbs

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\begin{bmatrix}
\text{PERSON} & 3 \\
\text{NUMBER} & \text{PLURAL} \\
\text{DISTRIBUTIVE} & +
\end{bmatrix}
$$

This agreement marker is not specified for animacy and so can agree with both animate and inanimate subjects, but only with a distributive interpretation. When the subject is animate, there is no difference in form between distributive and collective readings. However, when the subject is inanimate, the plural agreement marking on the verb marks distributivity.

2.7 Persian agreement marking: summing up

Verbal agreement marking in Persian is in part determined by the animacy of the subject. The basic generalization is that (non-existential) plural animate subjects trigger plural agreement, but plural inanimate subjects only optionally trigger agreement on the verb. We have argued that nouns receive their grammatical animacy specification based on whether or not the referents are conceptualized as animate. This conceptualization depends on actual biological animacy, but also on factors such as personification and agency. We further posited an independent lexical entry (18) in order to account for the fact that plural agreement marking can be used to signal distributivity. A handful of nouns are idiosyncratically specified as optionally animate, even though their referents are not animate. The examples given above were *deraxt* 'tree', *sokhan* 'word' and *shab* 'night'. When these lexical item are specified as [ANIMATE +] they can co-occur with the animate plural ending *-an*. In this case, they trigger plural agreement on the verb.

Many details still need to be examined,[8] but we hope to have shown that the intricate details of Persian agreement marking appear less puzzling if we keep in mind the tripartite division between the grammar, our construal of the world, and the world itself.

3 Inari Saami agreement marking

This section concerns agreement marking in Inari Saami, which is a Finno-Ugric language spoken in northern Finland. Inari Saami is similar to Persian and many other languages in that the verbal agreement morphology is sensitive to the animacy of the subject. This section sketches an analysis of the Inari Saami agreement system using the well-established grammatical features that were also adopted for Persian in the previous section. The analysis leads to the surprising conclusion that animals are grammatically specified as only *optionally* animate.

Pronouns in Inari Saami occur in three persons and numbers (19), and verbs are inflected to agree with the same three persons and numbers (20)–(21):

(19)   *Personal pronouns, nominative case*

	SINGULAR	DUAL	PLURAL
1	mun	muo'i	mij
2	tun	tuo'i	tij
3	sun	suo'i	sij

(20)   *'to be', present tense, indicative*

	SINGULAR	DUAL	PLURAL
1	lam	láán	lep
2	lah	leppee	leppeδ
3	lii	lává	láá

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8 For example, Mace (1962, 45) claims that plural agreement marking on the verb occurs when the subject refers to "people or higher animals". This suggests that Persian grammar recognizes a split between higher and lower animals.

(21)   *'to fish', present tense, indicative*

	SINGULAR	DUAL	PLURAL
1	kuá'lástâm	kuá'lásteen	kuá'lástep
2	kuá'lástah	kuá'lástvettee	kuá'lástvette𝛿
3	kuáláást	kuá'lástává	kuá'lásteh

Non-pronominal nouns, however, only take two numbers, singular (22) and plural (23)–(24). They do not inflect for dual, but dual number can be signalled by a plural subject and a verb with dual agreement marking (23):

(22)   Alma'i   kuáláást onne.
        man.NOM.SG fish.3SG today
        'The man is fishing today.'

(23)   Almaah   kuá'lástává onne.
        man.NOM.PL fish.3DU   today
        'The two men are fishing today.'

(24)   Almaah   kuá'lásteh onne.
        man.NOM.PL fish.3PL   today
        'The men are fishing today.'

    In addition to the fully inflected verbs illustrated in (20)–(21), there is also a partial agreement paradigm. This paradigm includes only two forms: third person singular (which agrees with all singular subjects) and third person plural (which agrees with all dual and plural subjects). The full and partial agreement present tense paradigms for *le𝛿e* 'to be' is given in (25):

(25)

		FULL	PARTIAL
SG	1	*lam*	*lii*
	2	*lah*	*lii*
	3	*lii*	*lii*
DU	1	*láán*	*láá*
	2	*leppee*	*láá*
	3	*lává*	*láá*
PL	1	*lep*	*láá*
	2	*leppe𝛿*	*láá*
	3	*láá*	*láá*

Multiple factors determine the choice of full or partial agreement; for example, partial agreement occurs in existential sentences (Toivonen, 2007a,b). Here, we only consider the role of animacy. Unless other factors intervene, human subjects trigger full agreement and inanimates trigger partial agreement (we discuss animals below):

(26)   HUMAN SUBJECT:
        a.   Uábbi   já viljâ   lává   meecist.
              sister.NOM and brother.NOM are.3DU forest.LOC
              'My sister and brother are in the forest.'
        b.   Kyeh'ti almaa láin   meecist.
              two   man   were.3DU forest.LOC
              'Two men were in the forest.'

(27)   Inanimate subject:

    a.   Kyeh'ti stuorra kee𝛿gi láá   meecist.
         two   big   rock   are.3PL forest.LOC
         'Two big rocks are in the forest.'

    b.   Táálust   láá   kyeh'ti vi'ste.
         house.LOC are.3PL two   room
         'There are two rooms in the house.'

Let us try to account for this generalization by adopting the same basic features and feature logic as in section 2. We set pronouns aside here and thus focus on third person agreement with full NP subjects. Like in the previous section, we adopt the feature ANIMATE. The following three agreement specifications account for the data in the examples above:

(28)   Agreement marking on third person singular verbs (e.g., *lii*)

$$\left[\begin{array}{ll} \text{NUMBER} & \text{SINGULAR} \end{array} \right]$$

(29)   Agreement marking on third person dual verbs (e.g., *lává*)

$$\left[\begin{array}{ll} \text{NUMBER} & \text{DUAL} \\ \text{PERSON} & 3 \\ \text{ANIMATE} & + \end{array} \right]$$

(30)   Agreement marking on third person plural verbs (e.g., *láá*)

$$\left[\qquad\qquad\qquad \right]$$

Recall that we are assuming the Elsewhere Principle (morphological blocking) which requires the use of the most specific agreement morpheme available. The third person singular form will be used when the subject is singular, whether it is animate or not. The third person dual form will be used when the subject is dual *and* animate.[9] The third person plural is an elsewhere case unspecified for agreement features. It is used for inanimate and animate plural subjects as well as inanimate dual subjects.

In the examples we have seen so far, positing the feature ANIMATE makes the right predictions. The subjects we have mentioned either correspond to animate referents (*man, sister, brother*) or inanimate referents (*rock, room*). Like in Persian, personification is possible in Inari Saami, and biologically inanimate subjects will trigger full agreement when they are conceptualized as animate. However, we now turn to animal subjects, and we will see that our ANIMATE feature does not correspond straightforwardly to biological animacy, nor to a view where animals are either conceptualized as animate or not. Animal subjects occur with either full or partial agreement:

(31)   a.   Kyeh'ti poccuu ruot'táin/ruot'tii meecist.
          two   reindeer ran.3DU/ran.3PL forest.LOC
          'Two reindeer ran in the forest.'

    b.   Puásui já peenuv lává/láá   meecist.
          reindeer and dog   are.3DU/are.3PL forest.LOC
          'The reindeer and the dog are in the forest.'

The observations from examples with human and inanimate subjects led us to posit an ANIMATE feature. Unless we reject that feature, the most straightforward option seems to be that nouns that refer to animals are specified as [ANIMATE +] ∨ [ANIMATE −]. Full agreement is compatible with the [ANIMATE +] feature, and partial agreement is compatible with the [ANIMATE −] feature. Note that we cannot assume that animals are underspecified for ANIMACY: if the animacy feature lacks specification, full agreement would be the only option

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9 We assume that plural nouns are specified a disjunctive NUMBER feature [NUMBER DUAL] ∨ [NUMBER PLURAL], in order to account for (23).

since we are adopting morphological blocking for independent reasons. Due to morphological blocking, the more highly specified form (e.g., *lává*) must be chosen when possible. If we were to posit that animals are not specified for ANIMATE, we would incorrectly predict that dual animal subjects could never take partial agreement.

Formally, the [ANIMATE +] ∨ [ANIMATE −] solution works well. However, thinking about what animacy intuitively means, this analysis seems odd. How can an animal be optionally animate? Our answer is this: an animal is not biologically inanimate, nor do humans conceptualize animals as being inanimate. Animacy in Inari Saami has been grammaticalized into a purely formal feature that is only loosely connected to animacy in the world, mediated by speakers' construal of animacy.[10]

The Inari Saami grammar does not reflect an animacy hierarchy that splits animals into higher and lower species. For example, one might imagine that bears and reindeer are conceptualized as higher animals and therefore higher on the animacy hierarchy than mice, squirrels and snakes. However, even though this might be the case in how speakers conceptualize animals, this is not reflected in the Inari Saami agreement system. Reindeer are important in the Inari Saami community but are nevertheless no more likely to trigger full agreement than rodents or ants:

(32)   Kyeh'ti muldesäplig láin/lijjii   nurheest.
         two   vole   were.3DU/were.3PL corner.SG.LOC
         'Two voles were in the corner.'

(33)   Kyeh'ti kuuδhâ jaamijn/jammii.
         two   ant   died.3DU/died.3PL
         'Two ants died.'

The analysis outlined in this section makes straightforward use of features and mechanisms that are widely adopted in the literature. However, there are of course other possible analyses (perhaps involving an [ANIMAL] feature) that could be adopted. As linguists, we need to decide: just how undesirable is it to classify animals grammatically as [ANIMATE +] ∨ [ANIMATE −]? Given the assumptions outlined in the introduction of this paper, this featural specification is actually not so strange. We know that there must be some mapping between the grammar and our construal of the world. There is also some mapping between our construal of the world and the actual world. However, the three levels or systems are distinct and the connections between them are not strict or absolute. We can therefore expect mismatches between the grammar and the world. Personification is one example, and grammaticalization of animacy is another. The use of ANIMATE in Inari Saami is not necessarily more strange than gender features. The features MASCULINE and FEMININE are often used for distinct genders, but grammatical gender typically has a very weak connection to biological sex. Similarly, past tense is not necessarily used exclusively to mark that an event took place in the past, it can also signal subjunctive mood or hypotheticals. We could decide to abandon the labels we have inherited from traditional grammatical descriptions, since there is never (or rarely) a one-to-one mapping between the world and the grammar. We could use α and β or 1 and 2 instead of ANIMATE, MASCULINE or PAST, but that seems undesireable. We use these labels because they capture some intuitions. The labels quickly and transparently reveal what the grammatical markers often or typically (or sometimes just diachronically) pick out in the world.

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10 As the reader can verify, adopting a HUMAN feature instead of an ANIMATE feature gives rise to a very similar dilemma: animals are optionally specified as being human (Toivonen, 2007a). We assume that specifying animals as [HUMAN +] is as strange as specifying animals as [ANIMATE −].

4 Conclusion

This paper has described and modelled the main characteristics of verbal agreement marking in Persian and Inari Saami. The animacy of the subject plays an important role for agreement in both languages, even though the details differ. The agreement facts suggest that it is important to distinguish between three different levels at which animacy can be understood. Two of those levels are cognitive: the grammar and our mental construal of the world. The way humans construe the world influences how words and phrases are classified in our mental lexicon and grammar. The biological animacy of entities in the world is of course also important, but the grammar can only access the world through our construal of the world. On this view, it is not surprising that there are mismatches between what is objectively classified as biologically animate and what is linguistically marked as animate in our grammars.

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