

language can be stored and processed slowly. Episodic memory, which is memory for time-related or autobiographical events, does show an age decrement while semantic memory, concerned with language and knowledge, is more resistant to aging.

The semantic memory store is well preserved in relation to what is contained in the memory, and healthy elderly people continue to take in new words to the store, although semantic memory processing becomes more variable with age. Retrieval becomes more difficult, but the ability to recognize words in the memory and to use networks of associations between the words is well maintained. Again, these changes usually do not affect normal communication, although the elderly frequently complain of difficulty in retrieving items from semantic memory.

2.2 *Aging and Attention*

Attention is central to linguistic or cognitive processing. The ability to process language may therefore be limited by the attentional capacity available to the individual. Sustained attention (vigilance), which requires the person to focus on one task, does not change with age, but selective attention, the ability to ignore irrelevant information, may

3. Normal and Abnormal Language Changes

It is not always easy to differentiate between language change during normal aging and those language changes due to age-related diseases. In the early stages of Alzheimer's disease, for example, which causes dementia, language testing can aid diagnosis but cannot yet confirm it. This area requires further research into what is retained in normal aging in order to establish a baseline for investigating what degenerates in abnormal aging. There is, however, a considerable overlap in performance on language tests and in communicative competence between the normal, healthy elderly and those suffering from a range of conditions such as depression, aphasia (a language disorder most commonly caused by stroke), and states of confusion caused by ill health.

4. Summary

Research into language change with age is complicated by the different methodologies and theories used and by the small number of replicated studies in this area; but there are a few leads. Language does change with increasing age, but, unless illness intervenes, the changes do not affect everyday communication. What can make communication

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dichotic listening tasks show that the elderly can perform well on sustained attention tasks but show decrements on some selective attention tasks which require more effortful processing or speed of response. These listening tasks may be compromised by 'presbycusis' (age-related hearing loss); some experiments have therefore used 'young elderly' people who have no hearing loss; but there are similar patterns of performance even in this group.

2.3 *Aging, Problem-solving, and Classification Skills*

One common image of aging is that of increased rigidity or difficulty in changing set. Cross-sectional studies on age differences in problem-solving ability have often used tasks that require language mediation. These studies have consistently shown that, in novel situations, elderly people find it difficult to generate the concepts necessary to solve a problem. In comprehending ambiguous sentences, the elderly are less likely than younger people to interpret both meanings. They also find it difficult to find strategies or to change to new strategies. However, when given a strategy such as category classification, to help with, say, remembering word lists, the performance of the elderly improves, although not usually to the level of the younger group. Some studies have found no differences in these skills between groups of highly educated older and younger people and have concluded that these skills do not show an age decrement if they are in everyday use. The very few longitudinal studies of problem-solving abilities also suggest that the age decrement is very small.

other cognitive parameters of language such as attentional resources and certain aspects of memory may also show small changes which add to the language-processing load.

See also: Pathology, Acquired: Causes; Word Recognition and Lexical Access; Parsing; Psycholinguistics; Language Production; Discourse Processing; Reading Processes in Adults; Pauses and Hesitations; Speech Errors.

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J. Maxim

Agreement

'Agreement' is widespread, being found in three-quarters of the world's languages, according to Mallinson and Blake (1981: 184). There are many instances which almost any

linguist would accept as examples of agreement, yet there is no generally accepted definition. A useful starting point is provided by Steele (1978: 610):

The term *agreement* commonly refers to some systematic covariance between a semantic or formal property of one element and a formal property of another. For example, adjectives may take some formal indication of the number and gender of the noun they modify.

The essential point is the covariance or matching of features between two separate elements, such as noun and adjective. Other attempts at a definition can be found in Keenan (1978: 167), Lehmann (1982: 203), and Lapointe (1988). Most writers treat 'concord' as synonymous with agreement; there is no distinction which is consistently drawn between the two terms.

There is a question as to whether the determination of the form of anaphoric pronouns (as in examples like *the girl . . . she*) is a part of agreement. The definition above covers such cases, and indeed most mainstream work on agreement uses the term in the wider sense to include pronouns. Barlow (1988: 134–52) reviews the research and concludes that there are no good grounds for distinguishing between agreement and antecedent–anaphora relations.

Traditional grammar recognized agreement as an interesting problem; it seemed relatively easy to state the general rules for agreement in languages like Latin, but several types of exception were identified. In modern linguistics, agreement was treated for some years primarily as a mere diagnostic for investigating superficially more interesting problems. However, Morgan (1972) showed that it is exceptionally difficult just to state the rules for verb agreement in English. Interest in the phenomenon has been increasing steadily, to the extent that there have been meetings devoted to the topic (see Alvarez, et al. 1984; Barlow and Ferguson 1988; Brentari, et al. 1988). The literature on the subject is extensive, and there is considerable research in progress, in different theoretical frameworks. Given the scope of the problem, this article will concentrate on the major topics.

Some of these topics arise even in the simplest statements about agreement. Statements of the type: 'X agrees with Y in Z,' are common, for example, 'predicate verbs agree with subject noun phrases in number.' The Y element, which determines the agreement, the subject noun phrase in this case, is called the 'controller.' The X element, whose form is determined by agreement, is the 'target.' 'X agrees with Y' specifies the 'domain' of agreement. And when the properties involved are indicated (agreement in Z, number in this instance), one is referring to agreement 'categories' (or agreement 'features'). Each of these topics will be examined; then the nature of agreement, its function, and the way in which it arises will be reviewed.

1. Categories

It makes sense to start with agreement categories, since they are essential to the subsequent discussion, and to look first at the possibilities, then at the problems.

1.1 Category Possibilities

Agreement in gender is common; adjectives may agree with their head noun in gender, as in these Russian examples (1–3):

bol's-*oj* avtomobil'
large car (a large car) (1)

bol's-*aja* mašina
large car (a large car) (2)

bol's-*oe* taksi
large taxi (a large taxi). (3)

The adjective changes its form according to the noun: in (1) it takes *-oj* because the noun *avtomobil'* 'car' is of masculine gender (a similar gender agreement form would occur with nouns denoting males); in (2) it takes *-aja* because the alternative word for 'car'—*mašina*—is feminine; and (3) shows the neuter ending. While such three-gender patterns are quite common, as are two-gender systems, languages with four and five genders are not unusual, and much larger numbers are occasionally found. Gender systems may have sex as a component, as in languages with masculine and feminine genders; but equally sex may be irrelevant; the distinction may be between animate and inanimate, for example.

The Russian examples also show agreement in number; all the adjectives are singular, to agree with the singular nouns. If the first noun is changed to a plural, the form of the adjective must change to match (4):

bol's-*ie* avtomobili
large cars (4)

The contrast here is just between singular and plural. Many languages have a third member of the number system, the dual, used for denoting two items. More complex systems may also be found, for example, with special forms for three items (the *trial*), or for a small but unspecified number of items (the *paucal*).

These same Russian examples also illustrate agreement in case: all the examples above are in the nominative case, as would be appropriate for subject position. If one is included in a prepositional phrase, the form changes again (5):

v bol's-*om* avtomobile
in large car (in a large car) (5)

The preposition *v* 'in' governs the locative case, and the adjective, like the noun, stands in this case. Russian has six cases and there are many Indo-European languages with similar systems. Much larger case inventories can be found, in some of the languages of the Caucasus, for example.

The other commonly occurring agreement category is person. Systems with three persons, like Russian *ja čitaju* 'I read,' *ty čitaješ'* 'you read,' and *on čitaet* 'he reads,' are familiar. Larger inventories occur in languages which subdivide one or more of these three persons in some way. For example, some languages (such as Quechua), subdivide the first person plural into the first person inclusive and exclusive; and the third person may be divided into obviative and nonobviative, as in Algonquian languages.

The final category for consideration is that of 'definiteness.' This is not often included in the agreement categories, but there is a case for its inclusion, as evidence particularly from Afro-Asiatic languages suggests. These examples are from Syrian Arabic (Ferguson and Barlow 1988: 6) (6–7):

rižžaal kbiir
man big (a big man) (6)

r-rižžaal l-kbiir
the-man the-big (the big man) (7)

For further exemplification of these categories see Moravcsik (1978: 336–62), and the entries on *Gender and Gender Systems*; *Number and Number Systems*; *Case*.)

1.2 Category Problems

While it is true to say that, for example, Russian adjectives agree with their noun in gender, such statements generally need qualification. This is because there are frequently restrictions on agreement. Thus German adjectives also show agreement in gender. But this agreement is restricted syntactically: within the noun phrase there is agreement, but when an adjective functions as a predicate (with the copula), then there is no agreement. There are often morphological restrictions too. The Russian examples (1–3), show agreement in gender; however, if the same phrases are made plural, the adjective in each case takes the same form as in (4); that is, agreement in gender is restricted to the singular number. And the restriction may be lexical: in the northeast Caucasian language Khinalug, most verbs show agreement but some do not.

The second type of qualification to the general statements of agreement possibilities is that the categories are different in nature. In the case of gender, it is an inherent feature of the noun. Gender is found on the target, say the adjective, as a consequence, in some sense, of its presence in the noun. In example (1), the masculine ending on *bol'soj* has nothing to do with the lexical meaning of the adjective, but results from the fact that the adjective is modifying a masculine noun. A somewhat similar situation obtains for person; in the Russian sentences *ja čitaju* 'I read,' 'first person' is an inherent feature of the pronoun, but not of the verb. In number, things are a little different, and more debatable. Number is an inherent property of some nouns: nouns which are only singular (like English *prestige*), or only plural (like *scissors*), impose this feature on their modifiers. Typically, however, a considerable proportion of the nouns of a given language can be associated with both (or all) numbers. In straightforward examples involving such nouns, like (4), the number feature appears to relate primarily to the noun; the property denoted by the adjective (largeness in this instance), is not affected by the change in number, which is again just a result of the fact that it modifies a noun which has this feature.

With case, the picture is different again; clearly not an inherent feature, case is imposed by government by some other syntactic element (the preposition in example (5)). Thus the noun and adjective in (5) are in the same case because it is imposed on both. They do indeed covary for case, but this covariance differs from that found with, say, gender; as a result some would not recognize case as an agreement category. Speaking metaphorically, it can be said that nouns start out having gender and impose it on their modifiers (similarly pronouns have person which they impose on their agreement targets); nouns typically gain number, which they impose on their modifiers. However, nouns gain case 'at the same time' as their modifiers and so come to have the same case. While this holds for the straightforward instances of matching of case within the noun phrase, there are more complex instances of covariance in case between predicate complements and their controllers (for which see Timberlake 1988 on Lithuanian, and references there to earlier work, especially by Andrews).

Finally, agreement in definiteness is an instance of a feature imposed on the noun phrase as a whole, which may be indicated at more than one point in the phrase; this gives rise to a matching of the definiteness feature. Previewing the later discussion, it might be said whether such instances count as agreement or not depends in part on whether it is considered *directional*. If 'X agrees with Y' implies that Y has the feature 'first' and then this is matched by X, then there is a strong case for saying that (5) does not in fact show agreement in case, nor (7) agreement in definiteness; if simple matching is all that is required, then they are instances of agreement.

The third type of problem with general statements of agreement possibilities is that there are instances where the features expressed by the morphology do not in fact match. A familiar one is found in English. The statement that predicate verbs agree with the subject noun phrase is contradicted, particularly in British English, by examples like the following (8):

The committee have decided. (8)

The subject stands in the singular, yet the verb is plural (see Sect. 5.2).

2. Controllers

Typical controllers present little difficulty of identification, yet there are numerous problems with the less straightforward cases.

2.1 Controller Possibilities

The discussion of categories suggests that the features involved in agreement are associated originally or primarily with nouns; traditionally nouns and pronouns are considered the normal agreement controllers. However, in subject-verb agreement, and indeed any agreement extending beyond the noun phrase, it appears that it is the noun phrase rather than the noun which is the controller. (A clear instance is agreement with conjoined noun phrases.) This poses little difficulty in that many would claim that the noun phrase's features depend on those of the head noun and so the noun is still in a sense the controller. On the other hand there is an asymmetry here, and there are examples where agreement even within the noun phrase cannot easily be explained as agreement with the noun; for these reasons, some, like Lehmann (1982: 221–24), claim that agreement is always controlled by a noun phrase. Either way, it is established that possible controllers are 'virtually always constituents in the N projection' (Pullum 1984: 82).

2.2 Controller Problems

The analysis of agreement controllers presents several problems. First, there are cases where different elements within the controller compete to control agreement. Thus if the subject consists of conjoined noun phrases, the verb may well agree with just one of them. In quantified expressions there is often competition between the quantifier and the quantified noun for the role of controller. Then there are instances where different potential controllers are in competition; for example, the predicate complement may compete with the subject noun phrase in determining the agreement form of the copula verb; this phenomenon is known as

'attraction' or 'back agreement.' (For examples of all these see Corbett 1988: 25–32; and for a case of complex interaction of competing factors in determining the controller see Tsunoda 1981 on Djaru, and compare Mallinson and Blake 1981: 88–89, and Comrie 1989: 191–92.)

Another common problem, and a serious one in some theoretical frameworks, is the existence of so-called 'pro-drop' languages. It may be desirable to say of certain languages, for example, Serbo-Croatian, that verbs agree with their subject in person and number, as in *ja čitam* 'I read,' *ty čitaš* 'you read.' In most circumstances, the more natural utterances would be *čitam* and *čitaš*. The problem is that the pronominal agreement controller is normally not present. For other problematic controllers see the remarkable data on Chamorro and Palauan presented by Chung and Georgopoulos (1988), and the Upper Sorbian data discussed by Corbett (1987).

3. Targets

Targets vary widely, and involve considerable problems of analysis.

3.1 Target Possibilities

Examples of agreement of adjectives within the noun phrase have already been noted. Demonstratives may also be found agreeing similarly, as may articles (definite and indefinite), various possessives, and numerals. The latter type of target is perhaps less familiar and so will be illustrated with examples from the Bantu language Chichewa;

chi-pewa chi-modzi (9)
hat one (one hat)

zi-pewa zi-wiri (10)
hats two (two hats)

Here the numeral agrees in gender and number with the noun.

In many languages predicate verbs agree with the subject noun phrase. They may also agree with the direct object (as in various Bantu languages), and with various other arguments. Personal pronouns agree with their antecedents (though some would exclude them from agreement, as discussed earlier), as do relative pronouns. Surprisingly, perhaps, the list continues. Adverbs can show agreement (in Lak and in Kala Lagaw Ya, for example), as can adpositions (Abkhaz), and there is even evidence (from West Flemish) that complementizers can agree. The possessed noun may show agreement with the possessor (again found in Abkhaz), and, more rarely, the possessor may agree with the possessed (as in Chamalal). For illustrations of all of these target types see Corbett (1991: 106–15); see also Lehmann (1982: 207–15) for useful data.

3.2 Target Problems

A problem which targets cause for accounts of agreement is that the realization of agreement may differ according to the target. In its simplest form, this difference is widespread in Indo-European; consider this example from Serbo-Croatian (11):

Milica je došla (11)
Milica is come (Milica came)

The auxiliary verb shows agreement in person and number (it is third person singular), while the participle shows

agreement in number and gender (feminine singular). These targets, then, show agreement in different features, but in the feature they share, namely number, they show the same value (singular). This identity of the shared feature is not always found, however, as this Slovak example shows (12):

Mama, vy ste taká dobrá! (12)
Mother, you are so kind!

Here, there is agreement with the plural pronoun *vy* 'you,' used honorifically; both parts of the predicate agree in number, but *ste* is plural, while *taká dobrá* is singular (and feminine). And when controllers allow agreement options (as, say, English nouns like *committee*, which allow singular and plural agreement), the particular target involved may have a major influence on the form chosen. (For detailed analysis of such problems see Corbett 1983.)

4. Domains

As noted earlier, when both the controller and the target can be identified the agreement domain is specified. Given the range of possible targets, it is evident that the number of possible domains is also large, both when looking at the possible domains in human language, and even when considering certain individual languages (see Moravcsik 1978: 362–66 for discussion). Ideally it should be feasible to derive the possible agreement domains from some more general principle. The most influential attempt to do this is that of Keenan (1978). In a nutshell, Keenan claims that X may agree with Y if, and only if, in the logical form of a given syntactic structure, the logical forms of expressions of X are interpreted as functions taking the interpretations of expression of Y as arguments: in other words, targets are functions and controllers are arguments. This account covers a large proportion of the attested domains: controllers, as demonstrated, are typically nominal, while targets, at least the common ones, may be viewed as functions or operators semantically (compare Pullum 1984: 82). Keenan's generalization is the basis for the *control agreement principle* of Generalized Phrase Structure Grammar (Gazdar, et al. 1985: 83–94), and of similar constructs in other theories. The important point here is that the *control agreement principle* specifies possible agreement domains by reference to the semantic types of the elements involved.

Before leaving domains it is necessary to consider some of the complexity involved. First, note that agreement may be 'downwards,' in the sense that dependents can agree with their heads, and as Nichols (1985) shows, it may be 'upwards,' since heads can agree with dependents. And then it should be said that there are instances of domains which seem to stretch the range beyond anything which might have been predicted. Consider the following data from the northeast Caucasian language Artchi (Kibrik 1972: 124) (13–16):

w-ez dija k'anši w-i (13)
I father like is (I like father)

d-ez buwa k'anši d-i (14)
I mother like is (I like mother)

b-ez dogi k'anši b-i (15)
I donkey like is (I like the donkey)

Ø-ez motol k'anši Ø-i (16)
I young goat like is (I like the kid)

Artchi is an ergative language: the part of the verb which shows agreement agrees with the object of a transitive verb; there are four different forms in (13–16), corresponding to the four genders of Artchi. With verbs of emotion and perception, the subject stands in the dative case; in the examples (13–16) it is a personal pronoun with an agreement slot, and this also agrees with the object. Thus one argument of the verb agrees, through it, with another. (Another remarkable agreement domain is described in Troike 1981.)

5. The Nature of Agreement

There are two problems which have dominated attempts to give a satisfying account of agreement: the question of directionality and the nature of the link between controller and target.

5.1 Directionality

As illustrated in the discussion of categories (Sect. 1), there is a clear intuition that agreement is in a sense directional. Consider this Russian example (17):

Irina čitala
Irina was reading. (17)

The noun *Irina* is feminine because it denotes a female. The verb shows feminine agreement (-a) because its subject is feminine—the reading is not feminine. A noun typically has only one gender, while the verb has alternative forms to match the features of a particular subject in a given sentence.

Early accounts of agreement, in Transformational Grammar, captured this intuition by copying features from the controller to the target. This works in many cases, but there are problems, several of which have already been encountered above. The controller may be absent (as in the pro-drop cases). This was handled by having the controller present, copying its features, and then deleting it (an approach not available in more recent theories). However, the controller may be present but be underspecified, as in this French example (Ferguson and Barlow 1988: 12) (18):

je suis heureux / je suis heureuse.
I am happy / I am happy. (18)

The first variant would be used by a male speaker, and has masculine agreement, while the second is appropriate for a female as it shows feminine agreement. A copying account of agreement requires two forms of the first person pronoun, even though there is no formal difference. Finally, copying analyses have problems with instances where the features on the controller and the target do not match (as with nouns like *committee*).

More recent approaches, notably that of Generalized Phrase Structure Grammar, allow free instantiation of feature on controllers and targets. Only those structures meeting certain constraints, typically, the identity of certain features, are grammatical. Thus matching of features occurs but without copying. The work is done by 'unification,' which has a vital role in several different frameworks. In such accounts there need not be any directionality of agreement—yet it represents an important intuition. In Generalized Phrase Structure Grammar this notion is reintroduced by the *control agreement principle* (see Sect. 4), which specifies possible controllers and targets, and

gives them different statuses. Since, however, there is no movement of features in such a model, it is more accurate to talk of the asymmetry of agreement rather than directionality.

Unification does not require that feature sets should be fully specified; it will allow analyses of the examples with absent and underspecified controllers. If, as in the second variant of (18) above, the controller is first person and singular but is unspecified for gender, while the target is singular and feminine but is unspecified for person, unification of the two will give the values: first person, singular, feminine. Thus agreement can be seen as a matter of cumulating partial information from controller and target (see Barlow 1988; Pollard and Sag 1988). It is still asymmetric in that the information relates primarily to the controller. (Note that this view would exclude from agreement most instances of case and definiteness matching.)

5.2 The Link between Controller and Target

The traditional view of agreement was that the link was a matter of syntax. To those who had worked on Latin, it seemed obvious that most cases of agreement could be covered by relatively straightforward syntactic rules. They were careful to note exceptions, where the features of the controller and target do not match (analogous to the English *committee* problem), and suggested that these show interference from semantic factors. This is still the dominant view. Those who appeal to the *control agreement principle* or some similar principle are claiming that the domains of agreement can be specified by appeal to semantics but the domains themselves remain a matter of syntax.

Others, however, follow a different line. Barlow (1988: 230), for example, cites examples like the following (19–21):

Five dollars is too much. (19)

John and only John is allowed in here. (20)

This team are going to win the cup. (21)

In such cases it appears that agreement is semantically motivated (taking semantics broadly). There is a plural subject in (19), yet a singular verb. The conjoined noun phrases in (20) have a single referent and so there is a singular verb. Example (21) is the opposite of (19); there is a singular subject and plural verb.

If an appeal has to be made to semantic factors in such instances, a logical move is to try to treat the whole of agreement as a matter of semantics (as suggested by Dowty and Jacobson 1988, for example). To take a straightforward example:

The cat sits on the mat. (22)

It can be argued that *sits* is singular because its controller *cat* denotes a singular entity. This is in the nature of the agreement categories of gender, number, and person: they all display a greater or lesser degree of overlap with the real world and therefore many instances of their use can be equally well treated as syntactic or semantic. It is significant that those who favor the semantic approach typically start from English data; English allows greater scope for semantics/pragmatics than almost any other language whose agreement system has been analyzed in any depth.

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G. G. Corbett

Ainu

Ainu is a near-extinct language that was once spoken widely in the northern Japanese island of Hokkaido, in Sakhalin and in the Kurile Islands. The current Ainu population, concentrated mainly in Hokkaido, is estimated to be around 24,000; but as a result of intermarriage between Ainu and Japanese, pure-blood Ainu are said to number less than 1 percent of that figure. Ainu is no longer used as a means of daily communication, and is remembered fully only by a handful of people of advanced age.

Ainu has not developed a writing system, but it is endowed with a rich tradition of oral literature. In addition to various kinds of songs, e.g., love songs and boating songs, Ainu oral literature contains both verse and prose. The verse forms, generally called *yukar* in Ainu, are recited epics that relate to the experiences of gods or to the experiences in love and war of heroes. The language of *yukar*, called Classical Ainu in this article, differs significantly from the spoken language; it is more conservative and has less dialectal variation as compared with the colloquial language. The two types of language show differences in both syntax and vocabulary, although there is a great deal of overlap. The most salient difference between the two is that Classical Ainu tends to be more strongly polysynthetic than its colloquial counterpart.

In terms of genetic affiliation, Ainu is best considered as a language-isolate. Although various suggestions have been made relating Ainu to such language families as Paleo-Asiatic, Ural–Altaic, Indo–European, and Malayo–Polynesian, or to individual languages such as Gilyak and Eskimo, none of them has progressed beyond the level of speculation. Various hypotheses for the genetic relationship between Ainu and Japanese have been entertained by many scholars, but other than the resemblances due to lexical borrowing and typological characteristics rooted in the common basic word order (Subject–Object–Verb), no strong evidence has been uncovered to relate the two languages. Indeed, Ainu has a number of morphological characteristics that distinguish it from Japanese, e.g., extensive use of personal affixes and a polysynthetic character as well as absence of verbal inflections.

Ainu has a rather simple phonological system with five vowel phonemes (/i, e, a, o, u/) and twelve consonantal phonemes (/p, w, m, t, s, c, y, n, r, k, ʔ, h/). Syllable initial vowels are preceded by a glottal stop; e.g., *aynu* [ʔajnu] 'person,' and this fact makes Ainu syllables conform to one of the following types: CV, CVC (for Hokkaido Ainu), or CV, CVV (long vowel), CVC (for Sakhalin Ainu).