Analogies and Universal Grammar

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Introduction

A few years ago, Frederick Newmeyer initiated a discussion on "The Linguist List" on the subject of "grammaticalization" (Newmeyer 1996). This is a topic belonging to the field of historical linguistics, and I do not want to pursue it very far here. A classic example of the process, mentioned later in the discussion by Oesten Dahl (1996), is the way in which the French future tense endings "irai" ((I) will go), etc, originated from the Latin infinitive "ire" (to go) and a full verb "habeo" ((I) have, keep). I am not sure of the details, but I think the belief of historical linguists is that the full verb became an ending under the influence of other verb endings for other tenses, in other words, by some process involving *analogy.*

A later contributor to the discussion, Benji Wald (1996), gives an English language example involving the origin of the passive form in "the bridge is being built". Before around 1700, this passive form did not exist, it seems, and the same meaning was expressed by "the bridge is building". Presumably the new form appeared because of the following possible analogy :

they built the bridge : the bridge was built
they are building a bridge : x

Analogy is clearly an important part of the grammaticalization process, and indeed it soon became the main topic of the ensuing discussion, especially after the following contribution by Esa Itkonen :

> Of course the 'Chomskyan framework' is incompatible with grammaticalization. Grammaticalization is generally conceptualized as a two-stage process. (Let us call the stages e.g. 'reanalysis' and 'extension'.) Reanalysis is based on a pre-existent model, i.e. it is an analogical process. Extension analogically generalizes the result of reanalysis to new contexts, i.e. it too is an analogical process. (This will be argued more extensively elsewhere.) Now, Chomsky's fondness of analogy is known to be minimal(ist).
>
> (Itkonen 1996a)

I quote that in full as it is rather too cryptic to summarise. The "elsewhere" that Itkonen mentions seems to be a joint paper by him and Jussi Haukioja entitled "A rehabilitation of analogy in syntax (and elsewhere)", to be found in A. Kertesz (ed.): "Metalinguistik im Wandel: die kognitive Wende" in the volume "Wissenschaftstheorie und Linguistik" (Frankfurt a/M : Peter Lang, 1997, pp. 131-177). At least, Itkonen refers to this in a later contribution to the same thread of discussion (Itkonen 1996b). Unfortunately I have not yet had a chance to peruse this work.

Itkonen's initial comment was replied to by Margaret Speas, in a contribution which again I quote in full (Speas 1996) :

> I'm not familiar enough with the issue of grammaticalization to comment on the first part [of Itkonen's message], but the claim that 'Chomsky's fondness of analogy is known to be minimal' is not right. What Chomsky has always claimed is that to say that language works 'by analogy' simply begs the question - which analogy? Of course English speakers draw analogies like the following :

play : plays : : glark : glarks

But Chomsky's point is that there are lots of reasonable analogies that no English speaker ever draws. Like :

John is easy to please : To please John is easy : :

John is eager to please : To please John is eager.

So the question is WHY speakers make some analogies and not others. The claim is not that language cannot involve analogical reasoning; it's just that you have to investigate WHICH analogies are made and which ones aren't in order to get at the root of knowledge of grammar.

Since Chomsky never seems to have investigated "which analogies are made and which aren't", one could argue that Speas' remarks only serve to show just how minimal Chomsky's interest is. Why has there been such a lack of interest in what one would naively suppose would be an important process in language? A hint of an answer was provided in a reply to Speas by H. Stephen Straight. Now that I have started quoting, I can't resist continuing :

> First, the anti-analogists cite alleged impossible analogies, but in so doing they provide incontrovertible evidence that such analogies *can* be drawn. (This is reminiscent of the efforts to prove to a speaker of language X that something that can be said in language Y cannot be said in language X by paraphrasing this alleged impossible Y thing in X, as if paraphrases didn't count!)
>
> Second, the anti-analogists claim that language acquirers never make the cited analogies, even though the examples they give typically reveal that such analogies

result in output that would be extremely hard to interpret using the comprehension and other processing strategies that many other completely non-analogical cases force upon the acquirer (as in the "To please John is eager" example). The possibility remains, therefore, that evidence for such false analogies fails to emerge because it is immediately suppressed by the acquirers themselves because of its uninterpretability. (Shades of colorless green ideas rise up to haunt us.)

Third, the anti-analogists explain the (alleged) non-existence of such false analogies by appealing to supposed universal principles of "grammar" known to the language acquirer and yet somehow separate from the acquirer's developing processes of language comprehension and production. The anti-analogists thus deprive themselves of the opportunity to base their account of language universals on the far more parsimonious claim that the ongoing interaction of the acquirer's developing comprehension and production processing -- which we need anyway - forces various outcomes as the acquirer endeavors to make sense of input and to produce intelligible output -- without any need for innate, overarching principles of language structure.

(Straight 1996)

The point that emerges is that analogy offers a possible account of language structure alternative to that of Universal Grammar, a point made several times in the ensuing Linguist List discussion of the subject. Universal Grammar and analogy are competing for the same territory, so it is not surprising that people who go for one of them would seek to belittle the other.

In what follows I want to explore how far analogy, together with a few other plausible assumptions, can explain the forms of human languages.

Remembering and Comparing

The first eminently plausible assumption is that human beings have capa-

cious memories, capable not only of storing the individual lexical items and grammatical rules of their language, but also some of the contexts in which lexical items were learned, in a manner to be explained shortly.

Imagine now some idealised learner of a language. We assume that this learner understands any utterances made to her, and compares them to each other. Suppose that two utterances made to her are

(1) John is coming

and

(2) James is coming

The learner will realise that both of these have the form

(3) α is coming

where "α" may be replaced by "John" or "James". Since the learner understands the utterances and is aware of John and James, "α" may represent for her whatever it is that John and James have in common : something representable maybe as a set of features, [+MALE], [+YOUNG] and so on. If now the learner hears the utterance

(4) Belinda is coming

The feature [+MALE] would be deleted from the list in "α", though [+YOUNG] and numbers of others might be retained. As more and more utterances of form (3) were observed, so "α" would be diluted until it contained no more than whatever features are shared by individuals that may be coming.

Note that up to now our learner cannot produce any novel utterance, but is restricted to reproducing those of form (3) that she has already observed. Now suppose she learns the utterance

(5) Belinda is sleeping

This establishes the pattern

(6) Belinda is βing

So now suppose our learner wants to express the thought (which she can entertain, though not express directly in language, from the contents of her memory) that "John is sleeping". There is a direct analogy for her to say "John is sleeping", namely,

(7) Belinda is coming : John is coming : :
Belinda is sleeping : x

Alternatively, we could say that the learner is employing a new template of the form

(8) α is βing

This would allow a more indirect kind of analogy. For instance, given "Lalage is laughing" and "Mary is swimming" as data, we could go straight to "Lalage is swimming" without any intermediate "Mary is laughing". Once an item is established as a member of "α", it can be linked with any "β", according to form (8). The learner can produce a *finite* number of new utterances going beyond the data she has received. Some possible utterances would be excluded on semantic grounds : estab-

lishing "the bus" as a member of "α" given "the bus is coming" would not sanction the production of "the bus is swimming". Nonsensical analogies can be excluded, even as Straight (1996), in the quotation above, dismissed Chomsky's silly analogical derivation of "To please John is eager", quoted by Speas (1996) above.

The number of new utterances which the learner can generate analogically if she wants to need not remain finite. For example, given the form

(9) Belinda thinks that γ

the membership of "γ", would, given an amount of data, be established as "virtually any sentence". Recursion, bringing with it an essentially infinite number of possible utterances, can arise from analogical processes too.

In many languages, membership of some set like "α" above would depend not only on semantic features but morphological ones too. Utterances themselves are part of the observable world. For instance, the learner of Latin could infer a form

(10) αus bonus est

from masculine names like "Primus bonus est", "Secundus bonus est" ("Primus is good", "Secundus is good") and so on. There would also be a form for feminine names of people

(11) δa bona est

given "Claudia bona est", "Vespasia bona est", and so on. Since all Latin nouns have masculine, feminine or neuter gender, the classes "α" and "δ" would come

to include nouns of all semantic kinds, just in virtue of their form. For instance, "Arena bona est", "The sand is good", would place "aren-" in set "δ", while "Oculus bonus est", "The eye is good", puts "ocul-" in "α".

Similarities between (10) and (11) suggest something like the following:

(12) ζx bonx' est

"ζ" combines "α" and "δ", while "x" and "x'" are either both "-us" or both "-a" : hence the pictured link between them. The diagram is just for illustrative purposes, and is certainly not meant to suggest any properly developed notation.

Another plausible assumption is that failed analogies are remembered and not attempted again. For instance,

(13) John talks : John talked : :
John sings : *John singed

The starred item would be remembered as a failure, and replaced with "John sang".

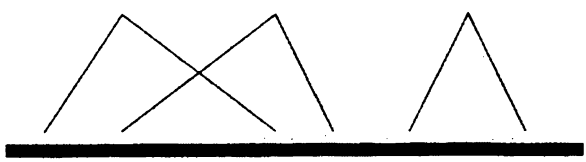
An important related principle could be expressed as a commandment : "do not make unnecessary analogies". If the item "sang" and its meaning had been observed already, there would be no need to form "singed" by analogy. If you already have the means to express some meaning, there is no need to go looking for another, generally speaking.

This principle could serve to explain, among many other things, why not every active form is paired with a passive one. For instance, since one can express a meaning correctly with the sentence "This cat weighs five kilos", there is no need to try the analogical form "Five kilos are weighed by this cat".

Kinds of Languages

What kind of languages would one expect to be easily learned by processes of analogy? The remarks I have made above do not lead to a conclusive answer, but a clue is provided by form (12). Spoken language necessarily involves linear strings of items over time, so order is naturally important. Form (12) reminds us that non-adjacent items may be linked, as well as immediately adjacent ones. These links need not depend on each other, however, and one could imagine patterns like the following schematic one :

(14)



I have already shown that languages exhibiting such patterns are a subset of the set of *mildly context-sensitive* languages (Stirk, 1999).

Objections

Certain results of psycholinguistic experiments are claimed to favour Universal Grammar rather than analogical processes. One such is outlined in Pinker

(1994), starting on page 42. Children were instructed to "ask Jabba if the boy who is unhappy is watching Mickey Mouse". They correctly produced the question

(14) Is the boy who is unhappy watching Mickey Mouse?

rather than the ungrammatical

(15) Is the boy who unhappy is watching Mickey Mouse?

If the children understand such statements and questions, however, they must have had experience of the use of "who", and observed that phrases like "the boy who is unhappy", like the name "John", belong to the class "α" of form (3) above. Such cases are surely explicable on analogical grounds.

Another class of objection to analogy is referred to in Hurford (to appear, p10 et seq). It involves the claim that sentences such as the following could only be recognised as ungrammatical by creatures whose mental apparatus contains the Universal Grammar principle of "subjacency":

(16) What do you wonder where John put?

(17) What do you believe the claim that John ate?

These cases involve the difficult issues of linguistic evidence. It seems to me that eliciting these fairly subtle grammatical judgements from people forces them to consider analogies they might not normally make, as a result of the principle mentioned above of "not analogising more than necessary". Thus surely the " echo question"

(18) You wonder where John put what?

is much more likely than (16), and generally in cases where there is more than one WH word. As for (17), I personally find it odd rather than ungrammatical. There is clearly the natural question

(19) What do you believe John ate?

which would do instead. I believe analogical thinking can tackle such cases, but I cannot put the argument more forcefully at present.

Conclusion

I have given a rough sketch of ways in which analogical processes may explain why human languages are as they are. The languages may be learned analogically, and their grammatical structures seem to be the ones which would arise naturally through analogical processes. I hope further work will make the case more convincing.

My hope burns brightly due to the fact that I am a convinced Darwinian (see Dennett, 1995, for a brilliant exposition of Darwin's theory and its wider implications). It is difficult to imagine how Universal Grammar could have arisen by any evolutionary process, but the development of memory, and the comparison of experience with memory, which is the basis of analogy, has obvious evolutionary advantages.

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